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Supply Chain Knowledge Creation Applications of organizational knowledge creation theory

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Supply Chain Knowledge Creation

Applications of organizational knowledge
creation theory

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Management Studies

ABSTRACT

Scholars argue that knowledge is a fundamental source for retaining competitive advantage, as value creation depends fundamentally on the competence of a firm to create new knowledge (Nonaka and Toyama, 2002). Knowledge creation is based on conversion of two types of knowledge: tacit knowledge, which is constituent to the comprehensiveness of an individual's consciousness, and explicit knowledge, which can be readily communicated. Based on the framework by Nonaka and Takeuchi (1995), one of the most significant and cited models, the motivation of this research is to expand knowledge creation model from intra- to inter-organizational relationships theoretically and explore supply chain knowledge creation process in practice to examine the sequences of this extension.

Studying three firms in the fashion industry, this thesis contributes to research on knowledge creation by taking a socio-technological perspective through a qualitative study of supply chain management. The research findings provide support for the proposed theoretical model in which social relationships and technology interact in the knowledge creation process to diminish supply chain complexities. While many supply chain relationships I observed appear to be influential in creating knowledge, one similarity among the cases here is that the effectiveness of the knowledge creation process has been limited due to the lack of harmony in employing knowledge resources. Knowledge creation process may be superficial due to the fact that they require a large revolution in work routines regarding the use of technology. Even where there is some degree of socialization, the process is partial because of incongruities between individuals understanding and corporate supply chain strategies.

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1. Introduction

1.1 Fundamental but Ambiguous: The Role of Knowledge in Supply Chain Management

Knowledge, what it is, what it means, and its roles for life and work have always had spiritual side and secular side. Plato, Nozick, Blackburn, Kirkham and Wittgenstein, to name a few, have all set out their own theories to respond these questions. In Catholicism, knowledge is introduced as one of the seven gifts of the Holy Spirit. It is no wonder that Socrates narrates the story of Thamus, the Egyptian emperor and Theuth the originator of the written word with the claim that emperor Thamus suspected the invention of ‘writing’ by arguing that the written word will inject ‘fake knowledge’ and it prevents our people to memorize large quantities of knowledge (Postman, 1992). In contrast, Herbert A. Simon (1916-2001) believes in the partiality of knowledge and articulates that knowledge has no fake or original but since it is communicated between people, it becomes a partial piece of equipment between rational entities called actual humans (Elster, 1983). In the ‘scientific knowledge’ as set out by Francis Bacon (1561-1626) highlighted by Desroches (2006), knowledge goes beyond its clear concept as it is argued that the notion should cover resided unconscious knowledge in addition to what humans articulate.

This brief glance through the chronicles of knowledge history proves in contrast to the majority of experts who claimed that ‘knowledge management’ is an emerging academic achievement (Spender, 1992; Drucker, 1993; Nonaka and Takeuchi, 1995); I have found the relevant issues discussed in old times. In addition to philosophers, even the pioneers of modern social institutions include knowledge into their academic disciplines. From Durkheim’s (1858-1917) ‘sociological tradition’ to Taylor’s (1911) ‘scientific management’ in early 20th century who introduces a form of industrial engineering that stabilized the organization of work as in Ford’s assembly line back in 1970s.

Nevertheless, it would be wide of the mark to presuppose that, all of the produced theoretical materials have been applied empirically. This can merely be in view of the fact that rarely a theory fits to the point so that practitioners follow the assumptions to actualize models. Here, knowledge management therefore depends on philosophical and social constructed notions of ‘knowledge’ in its valuation. This is

most probably the explanation why there is a distinction made between the importance of theory and its applicability for practitioners. So, how scientific knowledge as introduced by Freud, for example, can make a claim to certainty. This is due to the fact that the values attached to the mind-set of theorists come from its context in terms of the biological domain where knowledge resides. How knowledge is defined as such and how it is managed is therefore a complex process involving a range of factors.

In recent years, research on knowledge creation has linked tacit knowledge and explicit knowledge through linear causality where one type affects another in intra-organizational relationships, but they have no effect on inter-organizational networks. In so doing, scholars are taking a deterministic view in which knowledge creation is no more than a chain of events following one after another in organizational studies. This thesis argues that supply chain context provides for an interesting analysis of knowledge creation to include customer and supplier in the process of knowledge creation. In fact, in order to investigate how knowledge creation is valued and the intangibilities of these values, it is necessary to look at the relationship between the outcome (the creation of new knowledge), the involved parties/decision makers (organizations/individuals) and the context (supply chain). This is in line with Von Krogh *et al.* (2000)'s view, whereby value emerges from the interaction in inter-organizational relationships in continuously dynamic communications.

This thesis provides an account of involved partners in supply chains in the fashion industry in order to study the process through which knowledge creation is linked to supply chain management on the networked global market, thereby following the creation of knowledge, introduced by Nonaka and Takeuchi (1995), as it is processed within supply chain, with its inherent significance to be used by available resources to confront with complexities, therefore providing support for the proposed theoretical model.

Over the past two decades, the study of knowledge creation has appeared as a body of theoretical work thanks to the contribution of Kogut (1995), Zander (1995), Grant (1996), Spender (1996), Liebeskind (1996), Nonaka and Takeuchi (1995) who strive to produce models which indicate the extent of interaction that take part in managing knowledge. One of these theories is the Nonaka's knowledge creation model (Nonaka and Takeuchi, 1995) that has been widely cited and it has been

derived with positive results within organizational boundaries and researchers have suggested various tools and methods to tackle the model across different industries (e.g. automotive, construction, food and pharmaceutical industries) (Jonsson, 2007).

However, similar to other well-liked theorists, Nonaka has also been criticized, mainly, for the lack of empirical evidence meeting the requirements of doing business in inter-organizational dimension and its epistemological examination on knowledge (Gueldenberg and Helting, 2007). Here, although the knowledge creation literature demonstrated that knowledge management, in general, and a wealth of knowledge creation specifically, are heavily dependent on organizational relationships, the authors have only begun to scratch the surface of considering the implications of the role of knowledge creation in more complex conditions (e. g., global supply chain).

Nonaka *et al.* (2006), define knowledge creation in the most comprehensive fashion, as the process of involving individuals and organization's system for connecting knowledge. On one hand, the knowledge creation model has never been expanded from organizational to inter-organizational level that occurs as the result of social decentralization of work and technological enhancements; on the other hand, supply chain contributions in fashion context never extensively studied knowledge creation theory to exploit the potential of this theory.

In this study, the investigation is based on the Nonaka's assumption of the epistemological classification of tacit and explicit knowledge to retain competitive advantage in inter-organizational value creation (Nonaka and Takeuchi, 1995). Then, the ontological level is examined by involving supply chain literature. In the meantime, the supply chain is introduced as immensely important since the rivalries between individual companies have to have given way to that between a series of inter-dependant companies (Li *et al.*, 2006). In other words, the competitiveness of supply chains increases on condition that their activities become integrated both within and beyond organizational boundaries either in terms of product and process design for managing supply or marketing and advertising for managing demand (Christopher, 2005).

It is a new research route to bridge the gap of knowledge in theory, since not more than a few key factors concerning inter-depending supply chain and knowledge creation have been studied until recently (Marra *et al.*, 2012) and no previous research on the of knowledge creation in the supply chain has focused on supply chain knowledge creation using Nonaka's theory. Having found little evidence of valuable

work on integrating Nonaka's knowledge creation model to supply chain context in past practices, I attempt to contribute to the literature by moving the idea of 'supply chain knowledge creation' forward to the fashion industry.

As will be covered in the literature, this is an interesting time to study the fashion industry as well. The past decade has seen significant changes in the fashion market in terms of an increased shift toward its operations being described in global terms and used as a strategic decision-making due to complexities with balancing between the cost and the requirements of the market made up of time and quality (Giunipero *et al.*, 2008). The rapid rise of emerging supplying countries, especially in Asia, has led to the expanding popularity of outsourcing to these destinations, changing the global structure of the fashion world. These dramatic changes have resulted in the increased commoditization of products, directing the industry to new supply chain relationships.

This research is based primarily on semi-structured interviews with 74 interviewees, and observation of, work environment in a various departments and stores (primarily supply chain, logistics, import and export and international managers but also including managers in marketing, merchandising, strategy, human resources and IT departments). Furthermore, these companies use franchising business model as an alternative to build chain stores, there I separate direct sales and indirect sales via franchisees to increase the accuracy of collected data in customer knowledge creation. This is an enabler to scrutinize the process of knowledge creation in different circumstances in the last tier of supply chain. This thesis offers rich empirical evidence while revealing the structure of relationships embedded within the supply chain and how knowledge creation shapes the field through the valuation process.

The choice of the UK, Italy and Spain is significant in that to analyse the share of these countries in the global market. While the UK fashion retail sector attracts global audiences for its charm created across the centuries, the Italian Textile and Fashion Industry Federation announced that the Italian fashion industry by £45 billion revenues contributes to the European Union fashion system (SMI-ATI, 2009). Likewise, the fashion industry in Spain has been booming recently thank to the level of international growth into a chain of stores worldwide.

Whereas scholars in support of Nonaka and Takeuchi (1995) argue that knowledge creation process enhances value creation, my interviews and observations in three supply chains reveal that practitioners are unable to be fully engaged with the

implementation of knowledge creation. The materials that are presented in this thesis suggest that variables – social relationships, and technological infrastructures – are keys in studying supply chain management. I articulate that ‘supply chain knowledge creation’ accounts for knowledge creation process, which emphasizes how these two knowledge sources support supply chain threatened by global complexity. Depending on how complexities occur, knowledge resources may be available in various formats to convert types of knowledge for processing knowledge creation.

While many arrangements appear to be supportive, one similarity among the cases here is that the knowledge creation process is not systematically managed. It is incomplete because leading knowledge creation process requires a change in the supply chain routine and huge investments on technical advancements. Even when the idea of change is expressed, knowledge creation process is partial because supply chain practices are not sustainably organized to match with the rapid IT expansion.

1.2 Supply Chain Knowledge Creation: The Research Question

Rather than focusing on the technicality of management information systems or the social psychology, focus is positioned within the field of supply chain knowledge. This focus on supply chain knowledge came about due to a perceived failure in the marketing concept to explain the behaviour of suppliers in relation to customers in mainstream marketing theories. At the same time, the notion of customer relationships is an obscure one for supply chain scholars and the supply chain authors rely on managing operations to compensate for weaknesses in the recognition of the demand side. Here, instead of viewing the customer-supplier relationship as purely a transaction-based activity based on supplier production or customer demand, supply chain knowledge creation has moved on from simply imposing the marketing concept onto supply chain organisations, instead looking towards a long-term relationship, which is built on the capabilities of the involved parties to create knowledge. This thesis takes this argument at its core; focusing on three bodies of literature in the fields of knowledge management, supply chain management and fashion.

As far as the boundary of this research goes, it looks at supply chain relationships both on the macro political, economic, social and cultural level of institutional conditions such as the effects of the industry, government, and educational institutes, and also at the micro level of interaction between designers, store personnel and top to middle level managers.

To fully understand this notion, we need to comprehend the reactions of the companies to the supply chain complexities: how well do fashion companies employ the knowledge creation process in order to respond to the challenges of a globalising supply chain when players are geographically scattered? My analytical intention is to respond to the question of how managers utilise staffs and technological resources to implement the supply chain knowledge creation process, leading to the control of complexities. Based on this response, the thesis will address the above issues in the form of a central question.

Q. What are the complexities of supply chain and how are resources employed for processing knowledge creation to overcome these complexities?

In order to tackle this question, the research itself has been directed by three more categorical questions, which act to operationalize the central concern of this thesis so that the analysis chapters will be based on. Based on the type of activities, supply chain players can be divided into upstream and downstream members. Upstream members are dealing with the production activities, such as raw material suppliers, manufacturers and product distributors and downstream members provide product or services to end users such as wholesalers and retailers.

Q1. What are the complexities of internal supply chain and how knowledge creation is processed for intra-organizational purposes?

Q2. What are the complexities of external supply chain and how knowledge creation is processed within downstream chain?

Q3. What are the complexities of external supply chain and how knowledge creation is processed within upstream chain?

My dual concerns are first how do these companies employ their social capital throughout the chain to facilitate tacit-explicit knowledge conversion in order to lessen complexities? Second, how do managers conceive the availability of IT/advanced communication technologies to progress knowledge creation? In addition, empirically, the central argument, understanding knowledge creation in operational level in fashion industry, can be outlined in two terms. In managerial terms, is the use of theoretical knowledge creation process taken systematically or not

and how do managers react to its applicability? In employment terms, how is working under knowledge-driven supply chain?

Once the main research problem is formulated, the research aim should be set to address the objective of the study as presented below:

- How knowledge resources affect complexities in supply chain management?

These different dimensions of resources are likely to differ in the various scenarios of supply and demand management. By the same token, complexities can be defined differently in the supply side and the demand side as in the former knowledge creation is involved with the primary operations of productions, whilst in the latter knowledge creation is engaged in the relationship with customers.

By looking at the knowledge-creating process in the supply chain, the way in which such a process is managed is unveiled, and ways of making decisions on utilising resources are discovered.

1.3 A Collective Approach to Locate Knowledge in Vertical

Position: The Research Contribution

As has been alluded above, during the past two decades, the study of knowledge creation in organisational boundaries has appeared as a body of theoretical models (Kogut and Zander, 1992; Grant, 1996; Spender, 1996; Liebeskind, 1996; Nonaka and Takeuchi, 1995). These models have been used in a variety of forms to study empirical cases to demonstrate knowledge management in general, and how much of knowledge creation is heavily dependent on organisational relationships. For instance, Andersson *et al.* (2005) dedicated their research to study MNCs and they found it is important that their subsidiaries become embedded in the local business market, since it gives them the opportunity to identify new knowledge in their environment. It also enables them to assimilate this knowledge depends on the closeness of its dyadic relationships with different business partners. Likewise, in a number of IMP Group studies including a paper by Young and Denize (2000) knowledge is incorporated in management literature evident by the examination of its creation in business networks, its role in value creation within these networks (Moller & Svahn, 2002), and its function in innovation (Peters et al., 2012). However, for many of these researchers, there has been confusion over how to make the knowledge creation theories interlink with inter-organisational theories and therefore only a few number

of authors including Forsgren, Bjorkman and Andersson bother to define the backgrounds clearly and expand models successfully.

To clarify my position, based on the inter-organisational categories of relationships, knowledge creation can be processed narrowly (e.g., developing new product) or widely (e.g., improving performance). A narrow network has a direct link to an organisation, either vertically through a supply chain or horizontally throughout an industry while a wide network goes beyond immediate links. Each of these categories of inter-organisational relationships is planned and managed in a different way so with managing business process strategies, each relationship can be studied based on a theoretical concept of inter-organisational relationship to obtain a clear theoretical contribution to the literature.

Since this research is looking at supplier-customer relationships specifically, the first category (i.e. supply chain) will be studied to achieve projected objectives in the case of vertical relationships, which occur when firms cooperate across different levels of the value chain. In figure 1, the contribution of this thesis is illustrated along a conceptual continuum, starting from knowledge creation scholars and their theories.

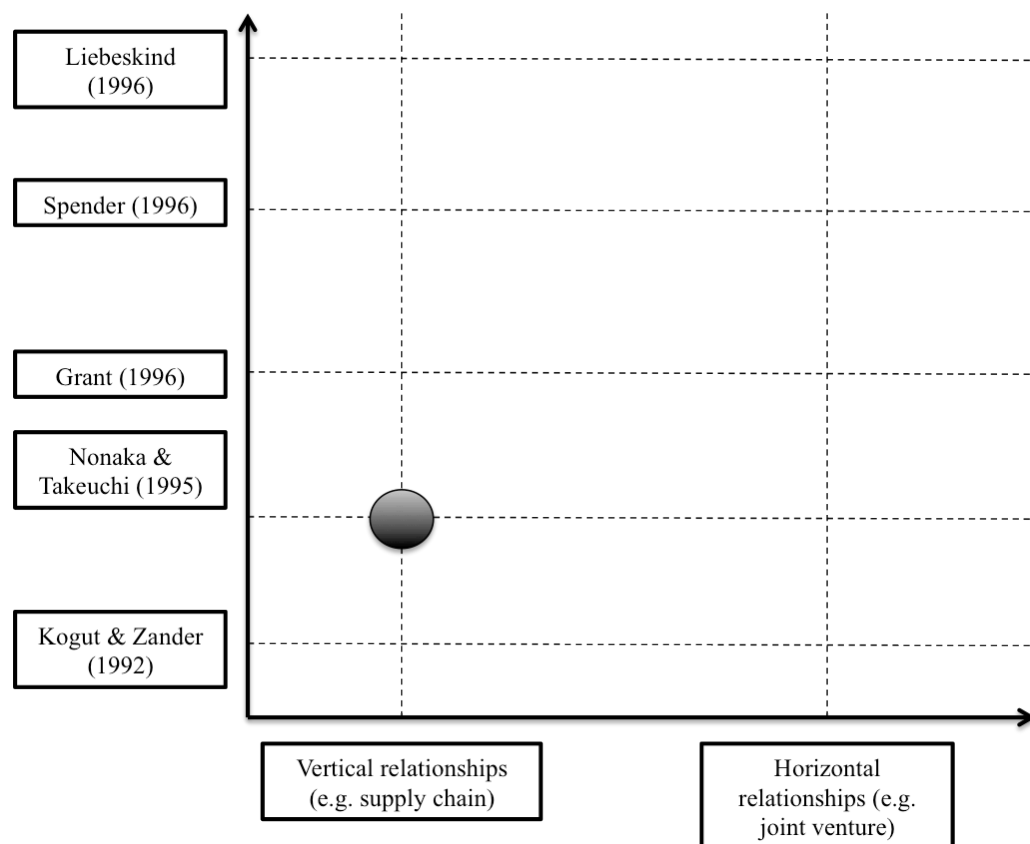


Figure 1. Research contribution in the literature positioning axes

To clarify the current trends in studying the linkage between supply chain and knowledge creation, it has to be noted that the literature has only begun to scratch the surface of considering the incorporate implications of external networking and therefore the role of knowledge management in supply chain is a new research topic, since not more than a few key factors concerning supply chain knowledge management have been studied (Marra *et al.*, 2012).

The limitations of most previous studies in interrelating supply chain management with knowledge creation are threefold: One is that some authors tend to focus on one particular stage of supply chain, e.g. manufacturing or logistics (such as Niemi *et al.*, 2009; Samaddar and Kadiyala, 2006; Choi *et al.*, 2004) or one inter-organisational project between supply chain members (such as Xiwie *et al.*, 2010). While this research instead, follows lead to push for a holistic view of supply chain knowledge creation, examining the operation of all aspects of the value chain in the fashion industry. It contributes both to the knowledge creation of demand by understanding how customers access the market and to the knowledge creation of supply by exploring elements of design, production and logistics which transcends inter-organizational boundaries in order to shed light on how this relates to supply chain positioning in confrontation with global business entanglements. In addition, by critically examining the involvement of partners in supply chain, I seek to provide a critique of limiting knowledge creation practice in organizational level, which can be applicable beyond the fashion industry.

A second limitation of current trends in the literature is that though the implication of supply chain relationships in this area has been noted in a number of studies, because the knowledge creation theories are unbounded and complementary, the details attached to the corresponding factors of a model and its impact were not independently expanded upon. In this sense, in contrast to previous common approaches which confusingly employ a mix of knowledge management theories in studying the supply chain (such as Khalfan, 2010), I aim to contribute to the literature by specifically looking at the way supply chain partners and their networks accrue knowledge creation in operations through accumulation of resources with respect to the characteristics of Nonaka's knowledge creation theory.

Lastly, the third limitation is that while Corso *et al.* (2010), Piramuthu (2005) and Wu (2008) refer to supply chain knowledge, they misidentify the role of

individuals to create knowledge and therefore the creation of new knowledge only resulted from technological advancements in the network relationships.

By taking this holistic view, this research describes results determined by experiment and observed behaviour of individuals about how knowledge creation is employed, looking at of technology management and social involvement in the analysis that informs observations on such data. This allows for an in-depth understanding of how knowledge is co-created, if it is, and if not what barriers are preventing that (e.g. economic factors).

This thesis also seeks to add to debates around global impacts by critically exploring the methods used in the research presented here and treating the issue of time, cost, and quality and their impacts on the constructed nature of supply and demand and their roles in the construction of different scenarios. Therefore, it is hoped that this research goes beyond the immediate influence of individual's work to the analysis of the ways managerial strategies in different cases unpick the relationship between strategies on delivering products and services. And finally, this study endeavours to contribute to the field by offering an examination of three cases in the UK, Italy and Spain. Beside, the models of the fashion business that tend to be applied in the traditional UK context and more creative Italian one that differ from the emerging Spanish fashion industry in which provides an interesting opportunity to make comparisons.

1.4 Research Outline

This thesis comprises of seven chapters. The first chapter begins with an introduction of the background and significance of the present study. Subsequently, key terms are defined and the research questions and objectives are highlighted. This is followed by the scope and the structure of the study.

In the second chapter, comprehensively, the theoretical approaches dealing with knowledge management, supply chain management and fashion industry are critically reviewed. Knowledge management is discussed as a part of resource-based view (RBV). Based on this model, resources are presented as the source of firm's capabilities to create competitive advantage. The introduction of knowledge-based view (KBV) highlights the importance of theories that lead to the formation of organizational knowledge creation theories. Against set criteria, it is proposed to lay out a map and in the end point a way forward in this field. This argument reveals that

knowledge creation theory as initiated by Nonaka is the most suitable theory for analysing the research problem and the objective within the presented framework. Then, framework by Nonaka is reviewed, emphasizing both the model and the contributions by supporters and critiques. Recent studies that have tested the model are also discussed by stressing on a choice of tools and mechanisms that can be used to support knowledge creation process and more specifically for how to create empirical practices in supply chain context.

From there on, supply chain is introduced as the proper context for examining the knowledge creation process, since the management of supply chain focuses on the way in which firms use a range of resources, including processes, technologies and capabilities to coordinate supply and demand activities. Following that, global supply chain is highlighted as a type of supply chain, in which the suppliers are sourced from a range of locations to customers in different locations. This is then tracked by the description of potential complexities and their negative impacts on operations.

Lastly, I discuss that the fashion industry with many attributes, such as short product life cycle, unpredictability, changeable markets and inflexible supply processes is a leading aspirant for an empirical examination. This thesis is about one process, the fashion supply chain that in the past used to be exceedingly centralized industry while the new trends tend to global operations. Fashion is greatly influenced by customers who inspire designers in the development of ideas. In this industry, changes in customer behaviour happens frequently and either fashion is defined as what organizations insert into the market or it is driven from customers' sexual pulses, the requirement of increasing the utilization of tacit knowledge to make products aesthetic is preceded in the analysis. This chapter approaches to its final page by the presentation of the analytical framework of the study, which synthesizes the literature to support the data collection stage.

In the third chapter, the appropriate research methodology as well as the way it is carried out to collect data are discussed. In order to illustrate and increase the reliability of data collection method, interviews, observations and the secondary data on daily bases in the case companies are outlined where appropriate. The collected data then are analysed in relation to the theoretical contribution in the forth, fifth and sixth chapters.

The forth chapter focuses on intra-organizational relationships and the positioning of individuals in the organizational core strategies. By following

responsibilities, level of managerial awareness for allocating resources to accomplish tasks are compared and contrasted at different levels. The chapter outlines the opportunities on which an organizational success may depend on the role of middle managers in different departments that find creative ideas and enrich them to meet expectations. Therefore, the success depends and how the middle managers' identity is formed throughout the knowledge creation process to arrange the daily tasks for encouraging the conversion of knowledge. In another scenario, the computerization of tasks weakens the role of middle managers in some occasions when technology is found to be an integral part of the top managers' success in tracking work directly. The chapter also explores the subjectivity of knowledge creation process that is to be linked for constructing inter-organizational relationships.

The fifth chapter examines the supply side relationships including design, manufacturing, logistics and distribution that underlie complexities of sourcing products. By understanding the way knowledge creation is processed through the proposed theoretical model, we can see the underlying strategies to utilize knowledge sources and whether social resources or technological capital can manage this process. The chapter emphasises the importance of processing knowledge creation steadily integrated in any step of supply chain since resource restrictions in any phase could lead to a partial outcome.

The sixth chapter looks at issues of demand side when a final product arrives on the market. It investigates how retailing, in general, and personnel in stores construct dual productive relationships with customers in one side and the suppliers in the other side. Once again, the examination of customer involvement in the knowledge creation process draws the line between the case companies in which occasionally franchising business format cause a serious disintegration between a consumer of a product and the companies.

Subsequently, in the seventh chapter, a comprehensive discussion is presented based on the major findings from comparisons; recent researches on knowledge creation to interpret the findings in the seventh chapter. Finally, limitations and implications are argued.

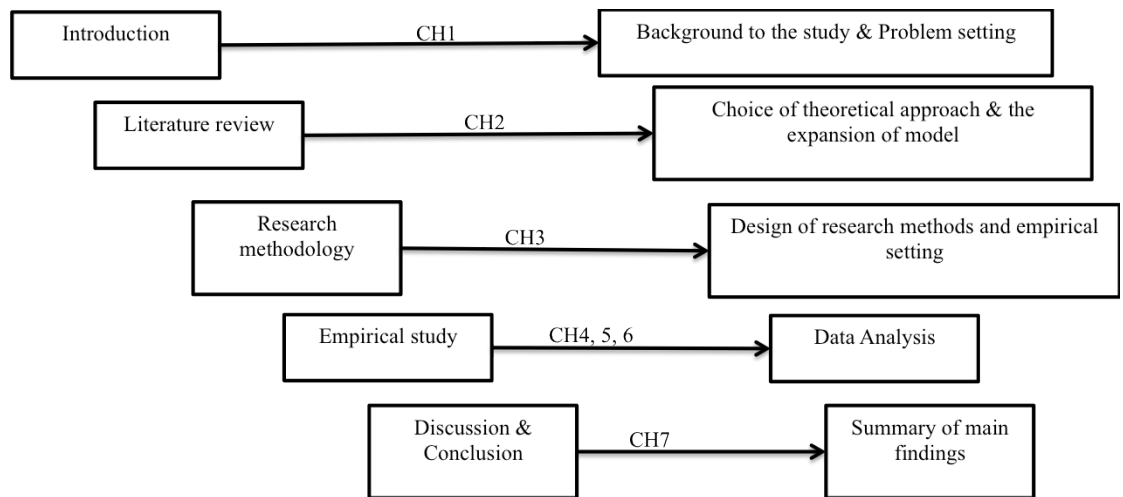


Figure 2. Structure of the study

2. Analysis of the Literature Review

As discussed in the first chapter, the continuous pressures to meet global competitive standards have led firms to practice various knowledge management strategies throughout their supply chain which assist in mitigating managers' challenging responsibilities. This chapter argues that the degree to which knowledge creation aids or hinders the enrichment of supply chain complexities relies on the way a firm adjusts the actual inter-organizational relationships, effectual organizational structuring and individuals' relationships. Later, in chapters 4, 5 and 6 case studies of three firms are presented as the evidence used to support this claim.

The first section of chapter 2 aims to unpack the approaches that conceptualize knowledge in different forms and types. It prepares a sociological framework for this research in order to extend organisational knowledge creation to the global supply chain, which is discussed in the second section. This section explores the underlying structure that characterizes supply chain appropriately. Subsequently, it demonstrates that current trends suggest supply chain changes should respond global issues since most businesses subcontract, at least, one part of their operations to lower the cost of production. Finally, this section ends by reflecting on complexities of global supply chains and the methods as offered in the literature to diminish challenges. By critiquing current strategies, supply chain knowledge creation is suggested as an opportunity for involving valuable resources to create knowledge in a network of dynamic relationships. In the third section, the researchers in the fashion business, such as Hines (2004) and Stone (2005) have been introduced to show the need for research in the field of fashion studies to engage previous sections of the literature in this particular industry. This study is, therefore, firmly located in the management research and, as such, a range of literature is brought together in order to consider wide theoretical implications for the field of fashion supply chain knowledge creation.

2.1. The Emergence of Knowledge

2.1.1. The Knowledge-Based View and The Decision Making Process

Although Grant (2002) argues that the roots of knowledge-based View (KBV) can be seen in recent perspectives, such as organizational learning, evolutionary economics, organizational capabilities, New Product Development (NPD), and

innovation, I refer to Emile Durkheimian's sociological tradition (1858-1917) and to Frederick Taylor's development of scientific management (1856-1915). I assume that knowledge-based research with a particular emphasis on the transformation of craft production into mass production and knowledge stream between workers were introduced quite long ago.

While the concept of knowledge belongs to the ancient time, its key role in the uncertain management behaviours has recently been found critical in current competitive global knowledge economy (Kogut and Zandar, 1993). So as of the early 1990s, knowledge, as a strategic organizational resource, was reborn in the literature (Al-shammari, 2009; Drucker, 1999; Davenport and Prusak, 1998).

Considering organizations in the 21st century are managed in environments, which are based on global operations, in conditions of high uncertainty, they need to adjust themselves to volatile conditions by developing long-term plans. A management decision, at best, is the combination of an organization's external nature and its internal setting. According to Scott-Morton and Allen (1994), organizations should make decision on their strategies to integrate various interconnected sources that are required to be in alignment with each other. A successful strategic decision presents a combined approach with reasonable emphasis on the external market to ensure that the company is aware of its industry, sector, suppliers and customers and on the organizational networks to retain culture, documents, identity, policies, routines, systems and employees (Hines, 2004).

In past decades, different organizational theories, such as agency theory, institutional theory, systems theory, and strategic choice theory, were introduced to help the formation of a competitive management decision making (Ketchen and Hult, 2007) but the three most emphasized theories are discussed below to allow an appropriate basis to be settled for defining knowledge:

Market Based View

Traditionally, organizations have competed on the basis of external environments. To corroborate this approach, in 1980, the market-based view (MBV) was developed by Porter to investigate firms' external competitions. Furthermore, Saunders (1997) completes Porter's model by examining the external influences in micro and macro levels, which the company and its competitors are affected by. It assumes to facilitate managers for developing an edge over rival organizations, and

once a firm has a market environment, symbolized by the presence of a well-built market position, its projected performance will be privileged.

Although the inter-organizational magnitude of social interaction is well argued here, Al-Shammari (2009) points out that the market relationships are typically momentary; they are diverse in their levels of significance for fulfilling customer needs. It is perhaps unrealistic to assess the attractiveness of a specified industry without considering the internal resources an organization offers to the industry. For the sake of an underestimation of internal resources for new value creation, the MBV models lack robustness.

Resource Based View

The legacy of the resource-based view (RBV) of firms came mainly from Wernerfelt's (1984) and Porter's (1985) publications. Within this theory, a firm's external position in an industry is based on internal substances (Wright *et al.*, 2001), which in turn are represented by a bundle of abilities and skills (Enz, 2009).

Porter (1985) highlights the functionality of RBV in comparison with more traditional theories that only observe organizations in search of a competitive position through external factors. By contrast, this theory emphasizes on the intelligence of an organization to protect its competitive advantage, long-term, through the development of new capabilities and reduction of barriers to reproduce, exchange or transfer assets (Slack *et al.*, 2006 and Dunning and Lundan, 2008).

In line with Slack *et al.* (2006), Crook *et al.* (2008) adds that organizations are only able to perform this theory if they discover the inimitable resources, evaluate their frequency and uniqueness, and protect those of value in order to improve performance. In other words, organizations exist because they provide generalized institutional capabilities that allow them to maintain effectiveness (Liebeskind, 1996). At this point, RBV theory was approaching to a level of maturity so as to regenerate 'knowledge' in the literature (Drucker, 1993; Nonaka and Takeuchi, 1995; Tiwana, 2001; Park and Kim, 2003).

During the 1990's, knowledge based perspective is built upon the RBV theory when a number of scholars, including Nonaka (1991), Spender (1992), and Kogut (1993), united to criticize this neo-classical/economical approach for allocating resources in 'black boxes' (Nonaka and Von Krogh, 2009).

Knowledge Based View

The Resource-Based View acknowledges knowledge as a general resource, rather than an exceptional possession, and later, does not construct any line between types of knowledge-based capabilities (Grant and Baden-Fuller, 2004). This inclusive approach to acknowledge resources is found to be problematic for two reasons. First, they do not satisfactorily clarify the dissimilarity between those resources that are inputs to the firm and the competencies that enable the organization to choose, organize, and systematize such inputs. This drawback is particularly noticeable when capabilities are those with dynamic characteristics. Second, the RBV does not address central differences in how types of resources may lead to a firm's competitive advantage. While the RBV recognizes different types of resource, it discusses them all in the same fashion (Kraaijenbrik *et al.*, 2010). By introducing firms as 'social communities' in which knowledge is transformed into economically functional products in current complex economy (Kogut and Zander, 1992), the focus from market-based costly legal issues was returned to intangible resources, as followed by Polanyi's (1962) work on the epistemology of social knowledge (Stewart, 1997; Klein, 1998).

KBV theory maintains that the organization's value usually emerges from the realization of new knowledge; how efficiently it uses what it knows, how it is deployed, and how quickly it is converted (Davenport and Prusak, 2000). Therefore, organizations have to use the competitive potential of knowledge management initiatives for managing market relationships. Zack (2002) supports this argument, and to highlight the effectiveness of knowledge-based approach in managing assets, he integrates MBV and RBV theories to accentuate a new era of research in knowledge studies.

2.1.2. The Concept and Forms of Knowledge

Although it is shown how knowledge was reborn recently in the literature, interests in knowledge have a long history in a various disciplinary backgrounds, particularly in the field of management that seems to follow two main routes.

The first route, in 1959, Peter Drucker introduces the term 'knowledge workers' for the first time in his book, 'Landmarks of Tomorrow', which then by Rasmus (2010) was added to the three elements of experience, technology and space to shape the realization of work in organization. In this quadrangle of knowledge

resources, technology is the evolving factor to automate work processes in order to increase efficiency,¹ space is the condition which allows work to be carried out², and experience is the motivational factor which is based on the worker, who by combining technology and experience in a space gives the organization its knowledge-based wealth producing dominance (Wiredu, 2012).

In the second route, in the late 1990s, Tom Davenport and Larry Prusak published a book, 'Working Knowledge', to examine knowledge in organizational science (Nonaka and Kohlbacher, 2007), which has continued Kenneth Arrow's (1962) economics perspective. From there on, further expression is given in his article, 'Learning by Doing', that was supported by Thomas A. Stewart (1991) to integrate knowledge management and intellectual capital from cognitive science perspective to the readers of 'Fortune Magazine'.

Nonetheless, the meaning of 'knowledge' causes disagreements between these scholars. They have been disagreed to reach a harmony on the definition. In other words, empirical heterogeneities in studying knowledge management are a consequence of variations in leveraging knowledge from the conceptual theories to the real world practices. At the same time the confusion is expanded to the practitioners who even though in most scenarios perform the so-called 'knowledge-based strategies', only a few of them witness clear changes in the outcome. Here, to clarify the divergence of opinions, the concept and forms of knowledge are critically reviewed to push Drucker's biggest dilemma, "to move from knowledge to action", forward (Drucker, 1999).

Concept of knowledge

Since data, information, and knowledge are interrelated, the nature of the relations among them is debatable. Many scholars view information and knowledge as synonyms, thus we could use them alternatively. Wilson (2002) criticizes the 'knowledge management' idea and he concludes knowledge management is publicized by a number of consultants and, since knowledge does not differ from information, this term is likely to be faded in the literature sooner or later. Hence, the

¹ For instance, presently, the Web 2.0 platform as a technological tool ensures that work communication is effectively improved by offering email, fax, blog, report and video conferencing

² With the rise of technology, spaces have also been moving from personal spaces to virtual spaces where work can be done at various remote locations either individually or in groups.

consensus seems to be that if knowledge means the same as data or information, then there is nothing new about knowledge management (Fahey and Prusak 1998). Another common view is that knowledge is the product of a knowing person and it survives only at an individual level. If this is the case, then how Albert Einstein's " $E=MC^2$ " which is derived from a human intelligence can be offered in information science studies (Zins, 2007). The third view shows that data, information and knowledge are part of a chronological order. In this category, Nonaka (1994) differentiates between knowledge, information and data by giving an example to highlight the humanistic side of knowledge which is missing in information: "reading that a company's annual turnover is £400 million is nothing more than a piece of information while knowledge is how £400 million compares with past turnover or with turnover posted by the company's rivals or, more importantly, what decisions, good or bad, led to that number" (Nonaka *et al.*, 2000).

In this example, it is believed that data refers to "a set of raw and discrete facts and observations" right at the beginning of knowledge creation process, information is 'processed data and meaningful context', and knowledge is a 'valid' (Machlup, 1983; Vance 1997) know-how (Kogut and Zander, 1992) and "meaningful set of information" (Nonaka and Takeuchi, 1995). Specifically, I draw attentions to the definition of knowledge given by Spiegler (2000) that I adopt for this thesis: knowledge is "a consequence of information processing operations" that is "depending on time and space".

While knowledge offers a basis for future predictions, information is descriptive and it belongs to the past and the present and misses the qualitative richness (Awad and Ghaziri, 2004). In addition, for a clearer clarification, this example of Nonaka (2000) could be considered which demonstrates the difference between knowledge and information from a different perspective: from an annual report of a company the turnover found to be £400 million and it is nothing more than a piece of information since it is not clear how this amount is benchmarked with previous turnover or with the competing companies' turnover or, more crucially, what decisions, suitable or unsuitable, led to that number. It is also humanistic, as relates to the beliefs of individuals (Nonaka, 2000). Therefore, those who manage this knowledge to create a new knowledge can claim to have achieved the wisdom as the ultimate stage (Harryson, 2000).

To make further notes on the characteristics of information and knowledge, Shih (2012) classifies the divergence as it is shown in table 1.

Table 1. Information vs. Knowledge (Shih, 2012)

Factor	Information	Knowledge
Nature of Information	Single facet Broken links	Multiple facets Breadth and depth Integrated
Presentation	Local optimization Limited SC representation One-way updates	Process efficiency Process integration Multiple-direction updates
Decision Making	Sequential planning Infinite planning Multiple iterations	Concurrent planning Constraint-based planning Single iteration Interdependent decisions Effective and efficient planning
Challenges	Bullwhip effect Multiple dyadic configurations Privacy/security	Co-competition

Forms of knowledge

Since this thesis is based on the acknowledgment of knowledge, it is important to learn whether or not it is documentable. Here, again, the perceptions of leading scholars vary; while some authors believe that knowledge cannot be documented, others disagree. Schwartz (2006) defends the former assumption, believing that “it is impossible to isolate and represent objectively a fluid mix of framed experience, values, contextual information and expert insight.” Likewise, Kluge *et al.*, (2001) states knowledge cannot easily engage with data on an inventory sheet. Meantime, some contributions claim that at least some types of knowledge cannot be transformed into other types in order to be documented (Tzokas, 2004; Herbig and Büssing, 2003; Collins, 2001).

Polanyi (1962, 1967) was the first scholar who introduced the theory of the two forms of knowledge, tacit and explicit, and he argues that explicit knowledge depends on tacit knowledge.³ In more details, he explains each person holds a volume of

³ Polyani (1967) expands this and notes that: “the declared aim of modern science is to establish a strictly detached, objective knowledge... tacit thought forms an indispensable part of all that

inherent knowledge which controls the ability to clear and therefore clarify knowledge.

Nonaka (1991) states tacit knowledge is subjective, physical, based on practice, and it is produced through recreated experience. This type of knowledge is either restricted ('sticky') in one's brain or embedded in group interactions (Morey *et al.*, 2000). Comparatively, knowledge to the western countries is explicit, computer-based, codified and available in symbolic outline or normal language. It deals with more objective areas (procedures, documents, software, etc.) and is limited in depth and coincidence ('leaky') (Nonaka *et al.*, 2000). While explicit knowledge includes declarative and procedural dimensions, in further action, Nonaka (1994) introduces tacit knowledge with two characteristics, cognitive and technical. The former refers to an individual's mental processes while the latter consists of concrete know-how that applies to a specific context.

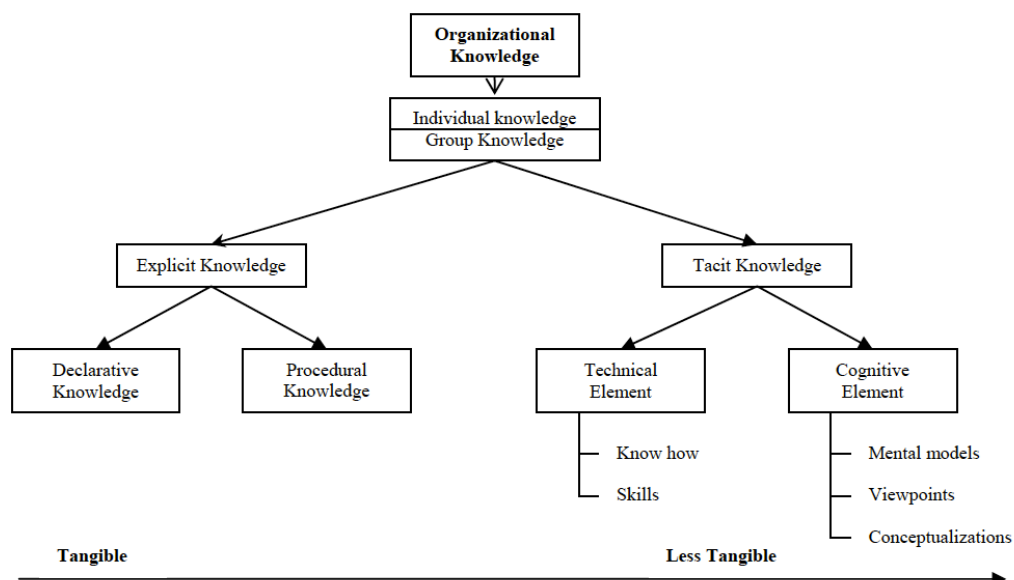


Figure 3. Diagram of knowledge (Li, 2007)

Lowendahl *et al.* (2001) advance this argument and classify knowledge in three types; know-how type that is experience-based knowledge with subjective characteristics; know-what type that is task-related knowledge and objective in nature; and, dispositional knowledge that is related to a person, such as talents and abilities.

knowledge, then the ideal of eliminating all personal elements of knowledge would, in effect, aim at the destruction of knowledge”.

Similarly, Taskin and Bridoux (2010) introduce tacit knowledge by describing task-related knowledge as a technical tacit knowledge which includes professional expertise and the knowledge of customers necessary to complete the job routines. In a more fashionable method, Vidal (2007) symbolizes a tacit knowledge frame and discusses that the level of competency differs between technical knowledge and practical knowledge. Despite the fact that both levels hold a certain degree of know-how, in practical level the knowledge goes beyond the basic understandings of involved procedures, and only repeated practices could lead a member of staff to that ultimate level. Most recently, Dinur (2011) presents nine detailed sub-categories for tacit knowledge to clear the source of its emergence. This classification builds on skills, cause-effect, cognitive, composite, cultural, unlearning, taboo, human and emotional that can be transmitted to the pull principle, meaning that human capital is motivated to learn and to thought.

Apart from that, in empirical studies, giant management consulting companies consider two perspectives over managing knowledge. Possession perspective takes a positivistic philosophy that knowledge is a fact valuing explicit form over tacit form, and also that knowledge is driven purely from intellectual process. However, practice perspective states that knowledge is contestable so all knowledge is open to dispute. Furthermore, knowledge is socially constructed and culturally embedded, therefore subjective and open for interpretation. For instance, the management of McKinsey and Company discusses that from the practice perspective tacit and explicit knowledge are intertwined. Stating that, complex interactions occur under no rulebooks to follow and employees must draw on deep experience to create tacit knowledge. To emphasize on the importance of tacit knowledge, a senior research manager at McKinsey explains that the importance of knowledge may alter in time and therefore it can manifest itself in the following example: Over 12 years, e-commerce, which was once identified as a significant knowledge domain, is now integrated in existed traditional industry 'sector's practices' such as retailing or banking. As such is today the important knowledge domain 'Climate change', which due to its transversal nature could be called an 'emerging practice'. What becomes of this knowledge domain will be learnt in time, whether it will integrate into another practice, form a practice, or disappear (de Viron *et al.*, 2011).

To implement these strategies, three different actors (i.e. the consultants, the researchers, the partners) are involved to take the steps of the process. In the first step,

to define knowledge gap, continuous discussions between the consultants and the team members responsible for each practice are arranged. Directing knowledge can be based on customer feedback, collective discussions, or a manager's personal experience. In the next step, once the agreement over the practice is achieved, resources are allocated.

On account of this example, McKinsey takes the practice-based perspective stating they share structural problem solving approach. All opinions are considered for being researched and analysed carefully. When it comes to McKinsey's general approach to knowledge management, the personalization strategy based on the conversion of tacit knowledge prevails over the codification strategy using technological instruments. Hence, in this sense the solutions adopt the customers' needs (McKinsey, 2010) when employees recognize the tacit knowledge in actual working environment by using people-to-people strategy before implementing lines of code to protect their company's intellectual property to manage explicit knowledge (Hansen *et al.*, 1999).

However, It has to be reminded that in spite of the fact that tacit knowledge is in most cases prior to explicit knowledge (Kogut and Zander, 1993), in this research, I employ them mutually dependent (Boiral, 2002; Torff, 1999; Spender, 1996).

2.1.3. In Pursuit of A Rational Theory: Organizational Knowledge Creation Theories

Considering that KBV offers insights into individual and organizational knowledge simultaneously, theories of knowledge-based view should be analyzed. Although the contributions expand the area of study to theorize six dependent capabilities, namely loss, integration, reuse/replication and protection (Kaplan *et al.*, 2001), over the past two decades, the study of knowledge creation has appeared as a body of theoretical work thanks to the publications of Ichijo, Nonaka, Kogut, Zander, Grant, Spender, Liebeskind, Takeuchi and Von Krogh which are brought about.

Regardless of tensions between these organizational knowledge studies, three concepts can be characterized evenly; first, organizations set particular resources that are heterogeneously disseminated; second, competitive advantage is based on the organizational knowledge to incessantly integrate resources into value creation competencies; and thirdly, the organization advances competitive advantage by intensifying knowledge and by knowing the contexts in which knowledge creates

value. Hence, as notes by Priem *et al.* (2001) “resources, representing what can be done by the firm, and the competitive environment, representing what must be done to compete effectively in satisfying customer needs, are both essential in the strategy-making process.”

Kogut and Zander

As Kogut and Zander co-authored most of their publications for theorizing the role of interaction in the social settings, their argument is relevant in studying knowledge, the capabilities of an organization and inter-organizational networks. From this perspective, their work greatly contrasts the sociological units of classical theorists such as Marx (class dominance), Durkheim (organic solidarity) and Weber (bureaucratic society) in step with much attention to the concept of ‘combinative capabilities’. It explains how knowledge is leveraged in the course of knowledge reuse/replication. Knowledge reuse/replication, here, is introduced as the capacity to transfer knowledge from an entity that can be an individual or an organization to a receiving entity without losing it. Possibly, the most evident case is that of reproduction of processes for repeating value creation that physically connects operation to revenues.

“Unless able to train large numbers of individuals or to transform skills into organizing principles, the craft shop is forever simply a shop. The speed of replication of knowledge determines the rate of growth; control over its diffusion deters competitive erosion of the market position. For a firm to grow, it must develop organizing principles and a widely-held and shared code by which to orchestrate large numbers of people and, potentially, varies function” (Kogut and Zander, 1992).

For instance, Intel’s ‘copy exactly’ attitude for structuring semiconductor plants is following the combinative capabilities of Kogut and Zander (1992). In this case, while changes are not permitted to any plan of a plant, district plants must duplicate every feature of the sample plant. Another example is the McDonalds franchise which confront knowledge transfer challenge, as they must replicate products and processes distinctly (Ichijo and Nonaka, 2007). At this time, headquarters recognized the idea of ‘arrow core’, “all the information a franchise requires in a district about valued business attributes and their creation in order to succeed” (Winter and Szulanski,

2000). Here, the strategy of replication is utilized effectively to determine the core knowledge resources for those tasks in order to identify talented replicators and to transfer necessary knowledge in inter-organizational level.

In a later empirical research, Kogut and Zander (1995) suggest that to enhance the reuse of knowledge, a degree of codification signifies knowledge capabilities on the rapidity of transfer to other workstations. They argue that the reprocessing culture of the organization enhances learning and allows an understanding of organizational knowledge and knowledge across the boundaries.

Regarding Kogut and Zander publications, although the organizational scheme is appreciated, it has been subjected to a number of criticisms (Von Krogh *et al.*, 2000). The critiques mainly target the lack of systemized transferability and the ignorance of the role of individuals in knowledge creation. In the circumstances where we accept the independent role of an organization in creating a culture for its members, it seems important to ruminate the role of each individual in generating this culture as well. For instance, by a simple comparison between a CEO and a middle manager in a multinational organization in one hand, and with another middle manager in a competing organization on the other hand, it appears that the focus of Kogut on an organization in terms of a cultural unit causes a boundary which disregards/neglects the imprint of same-level members at different organizations on each other.

Thus, the distinct culture of divisions and departments from that of organizations are not differentiated. In the same manner, Kogut and Zander's clarification of the organization as an "efficient mechanism for creation of knowledge" seems to exclude inter-organizational networks as the model is centralized in the heart of company and the creation of ideas sticks to the company's internal borders. Therefore, there is an exclusion of value chain relationships (e.g. customers and suppliers) in originating creative ideas (Thomke and Von Hippel, 2002). In contrast, in an empirical example, Michael Dell, in one of his interviews conducted by Harvard Business Review, states "a customer says: 'Hey, can you put an asset tag on my PC?' (...) And then you do it for one customer, then for ten, for hundred, and eventually it becomes a standard offering (...) close customer relationships have allowed us to dramatically extend the value we deliver to our customers" (Magretta, 1998).

At the same time, firms do not necessarily need to follow a knowledge reuse/replication strategy at organizational level to achieve profitable results. Buckman Labs signifies an example of a global management style via virtual learning centres that used fast internal knowledge creation to beat competitors. In the 1990s, Buckman initiated a global systematic network to store knowledge through which employees could find organizational expertise to meet regional customers' requirements that lead to 250% sales growth over a decade, and 35% growth from products in a five-year period. For instance, the service, which is given to an Australian user probing for financial information, is in English with an Australian specific context that differs from an African user who is given the same service with a choice of English or Afrikaans to access the African contents (Fulmer, 1999).

Grant, Spender and Liebeskind

Grant is another pioneer in studying knowledge creation. He began showing his interest in the '70s and then in the '90's. He co-edited with Spender, who became his critique afterwards, on an especial issue in Strategic Management Journal on 'Knowledge and the Firm'. He emphasizes the role of individuals and calls managers for undertaking the task of combining individual knowledge with particular mechanisms to boost language, emblematic communication, harmony, mutual recognition and shared meaning. His theory advances Kogut and Zander's model by including tacit and explicit knowledge, yet he has a radical individualistic approach to knowledge levels and therefore knowledge is not argued as a multi-level concept (i.e. epistemological dimension).

Now, my viewpoint is closer to DeLong (2004) who criticizes Grant's, Kogut's and Zander's static views of the firm and supports Spender (1996) who assumes the organization has the ability to know independently of its employees. To corroborate this view, Spender goes beyond Grant's individualistic ideology by involving the forms of knowledge, tacit and explicit, in his discussion and social interactions.

Here, Liebeskind (1996) does not buy Spencer's ideology that he creates a distinctive identity for organization. Liebeskind (1996) argues that even though the individualistic nature of knowledge makes it leaky, firms' protection capabilities can prevent the loss of knowledge. In this case, protection refers to the organizational capacity to control the unattended replication of knowledge. Firms can decrease the opportunistic behaviour of third parties, tighten the employment contracts to manage

knowledge workers' tasks and protect knowledge by pleasing individuals (Erden, 2010). However, she acknowledges that these protective actions are costly and difficult to work with.

To oppose this view, DeLong (2004) supports Spender (1998) and notes that since organizations expect this loss of knowledge, managers are faced with the obligation to develop capabilities and to think about managerial expertise that can be shifted to generations of employees. According to DeLong (2004), knowledge loss is a severe threat in modern societies. DeLong quotes an example at DuPont where losing knowledge referred to the diminished capability for an action in the organizational boundary. In this example, the knowledge of DuPont was in an experienced engineer's head that helped originating high-pressure compressors for running polyethylene reactors.

What DeLong (2004) supports is the fact that organizational knowledge can be as leaky as individual knowledge. Lost knowledge can occur at a broad organizational level, such as the potential loss of a quality-testing capability within a team level or in an individual level (Ichijo and Nonaka, 2007). This can affect performance in social knowledge, cultural knowledge and structured knowledge all in the same way. Tacit knowledge exists in social relationships between individuals or within teams. Likewise, cultural knowledge reflects a collective understanding of how things are prepared in a particular level. Finally, structured knowledge is set in an organization's systems, tools and routines as introduced in part of knowledge systems and this is the firm's responsibility to transfer knowledge from employees' heads and store it in independent knowledge warehouse (Durkheim, 1964).

To this end, the involvement of knowledge creation theorists was demonstrated to show major line of thoughts that often seem to be in opposition. The synopsis of the involvement of the aforementioned scholars according to their main contributions in the establishment of their theories is summarized in table 2. While Nonaka's theory will be discovered below, the evaluations of all scholars are based on their concentrations versus their explanations.

Table 2.The comparison of contributors to knowledge creation theory

Scholar	Theoretical explanation	Concentration level
Kogut-Zander (1992)	Collectivism	Organization
Grant (1996)	Individualism	Individual/Organization
Spender (1996)	Collectivism	Individual/Organization
Liebeskind (1996)	Individualism	Organization
Nonaka (1995,2000)	Individualism/collectivism	Organization

2.1.4. The Nonaka's Organizational Knowledge Creation Theory

Nonaka's knowledge creation theory is one the most widely known and accepted theories taking a new opening point in the knowledge creation literature. In fact, the "popularizing influence of knowledge management was Ikujiro Nonaka, who produced series of papers and a book (Nonaka and Takeuchi, 1995), that set the standard for this emergent field with a rich mixture of concepts and field data" (Easterby-Smith and Lyles, 2003). This theory applies to such diverse management areas to demonstrate how firms subsist as alliances between knowledge creating entities to protect the creativity (von Krogh *et al.*, 1994).

Nonaka and Takeuchi (1995) define organizational knowledge creation as "...the capability of a company as a whole to create new knowledge, disseminate it throughout the organization and embody it in products, services and systems". To support their definition, in 'The Knowledge-Creating Company' (1995), Nonaka and Takeuchi declare that western companies' views on managing organizational knowledge lacks an understanding of the way in which it is created. In the west, the organization is an 'information-processing machine' which processes information from its surroundings in order to fulfil a requirement. This inactive view of the organization does not capture knowledge creation, which should be dynamically processed.

Instead of merely solving problems, organizations are entities which use their action and interaction in order to create knowledge (Levinthal and Myatt, 1994). Therefore, the most important aspect of a company's capacity is its dynamic ability to

create knowledge constantly and more willingly than it acquires the “stock of knowledge” in form of a particular technology that a company collects at a single point in time (Barney, 1991). This innovative view calls for a re-examination of the abovementioned theories to review how knowledge is managed and how it interacts with a firm’s sources of knowledge.

Nonaka proposes that knowledge is created through the continuous interaction of tacit and explicit knowledge, which can be formed as a model. Nonaka’s model shows two dimensions for the procedure of knowledge creation; ontological and epistemological dimensions. While the epistemological dimension strives in the conversion of tacit-explicit knowledge, the ontological dimension applies the knowledge levels view from the individual to the group, to the organization, and finally leads to an inter-organizational entity. Both dimensions of knowledge creation shape the basis of Nonaka and Takeuchi’s framework (1995) in which traditional models and modern theories are integrated into the theory of organizational knowledge creation.

Thus, the theory follows a combined perspective of individualistic and collectivistic perspectives on the condition that knowledge creation leads to the ontological level with the expansion of individuals’ participation. Therefore, organizational knowledge is in two forms of knowledge that is comprehensible and retainable by an individual and a collective as an organization shares it. While an individual knowledge is inherently transferable, moving with the knowing person, rising Pareto rents and causing agency problems, the organizational types of knowledge are social-wide available and collectively rooted in an organization’s practices and norms (Nonaka and Takeuchi, 1995). In order to create new knowledge, Nonaka’s model comprises four modes of SECI process through conversion between tacit and explicit knowledge; (1) tacit knowledge to tacit knowledge; (2) tacit knowledge to explicit knowledge; (3) explicit knowledge to explicit knowledge; and, (4) explicit knowledge to tacit knowledge (Nonaka, 1994).

Socialization Mode (Tacit to Tacit Knowledge)

The socialization mode (from tacit to tacit) is described as “a process of sharing experiences and thereby creating tacit knowledge such as shared mental models and technical skills”. In this mode, although the more tacit the knowledge is the less likely it is subjected for transformation from one person or team to another through passive

learning techniques, tacit knowledge may be transferred between individuals through the use of language in informal meetings outside of workplace and other forms of communication like of the traditional apprenticeship. Apprentices complete this knowledge transfer through interpretations and observations. The more knowledgeable they are, the easier is the praxis. To visualize the concept, Nonaka and Takeuchi note the off-campus meetings to 'brainstorm' to solve complex challenges of Honda where staffs develop harmony by discussing experience in communal baths (development of brainstorming camps) (Nonaka and Takeuchi, 1995).

Externalization Mode (Tacit to Explicit Knowledge)

This mode relies on analogies, metaphors, hypotheses and models expressed through systematic language. When sharing ideas, an individual will try to articulate concepts by the use of language in multiple forms. Sometimes these methods are not enough and then the transmitter and the receiver engages to 'reflect' before further 'interaction'. Nonaka and Takeuchi describe the significance of the use of metaphors and analogies for the creation of new ideas among employees and explain how these attributes direct people to tell what they know (Polanyi, 1967) in order to increase mutual trust. This also helps to draw pictures in people's minds to ease a difficult to understand operation or situation. In global schemes, many firms tend to use universal metaphors to allow everyone to be able to drive out the understanding of the words. For instance, an employee's comparison of a CEO of a company who sits over an operative organization to Queen Elizabeth immediately brings to mind the image of an individual who is influential. Here, intuition is pooled with deduction and induction to create a new concept that is expressive and effective. At this point, explicit knowledge is created (Nonaka and Takeuchi, 1995) and Nonaka *et al.* (2000), in addition, epitomize an example to demonstrate the shared social process is in well-understandable form by stating that employees could employ quality control circles for manufacturing processes to articulate the accumulated tacit knowledge on the shop floor gathered over years of working.

Combination Mode (Explicit to Explicit Knowledge)

This mode adjusts explicit knowledge into further complex sets of explicit knowledge. As Nonaka and Takeuchi (1995) observe, the "combination is a process of systemizing concepts into a knowledge system". At this level, employees replace, sort, add and combine knowledge into a variety of kinds and therefore expand new

knowledge for their intentions. For Nonaka and Takeuchi (1995) ‘crew members’ who consist of the knowledge officers (top management), the knowledge engineers (middle managers) and the knowledge practitioners (front-line employees) are key people to identify, promote and create knowledge within the organization. However, the role of middle level management is central in this mode because they create new concepts through their networking of codified knowledge as well as linking tacit knowledge of top management and front-line employees into explicit knowledge, which should be employable across the organization (Payakpate, 2008). Similarly, Nonaka *et al.* (2000) states that “when the manager of a company collects information throughout the organization and puts it together in a context to make a financial report, that report is new knowledge in the sense that it synthesizes knowledge from many different sources in one context”.

Internalization Mode (Explicit to Tacit Knowledge)

Lastly, the internalization mode (from explicit to tacit) embodies the step from explicit knowledge into tacit knowledge. This step is explained as ‘learning by doing’ (Nonaka and Takeuchi, 1995) and it is progressed through the knowledge modes into the individual’s tacit knowledge shapes the bases of shared mental models or technical know-how. Individuals can access documents, structured methods, knowledge databases, manuals and training courses at any time to boost their knowledge creation skills. The great volume of this knowledge can be digitized and put forward through the previous mode, i.e., combination mode. General Electric’s customer ‘Answer Centre’, for example, is employed as a source of explicit knowledge which new product development members can access customer feedback. Also, for Honda City project, managers practice “Let’s give it a try” to support the group members when they want to internalize a greater breadth of development experience than their own specialization (Nonaka and Takeuchi, 1995).

All four modes are individually crucial for knowledge creation process to together facilitate the sustainability of tacit-explicit interaction. In figure 4, it is shown that knowledge creation takes on a spiral path in a series of self-transcendental processes.

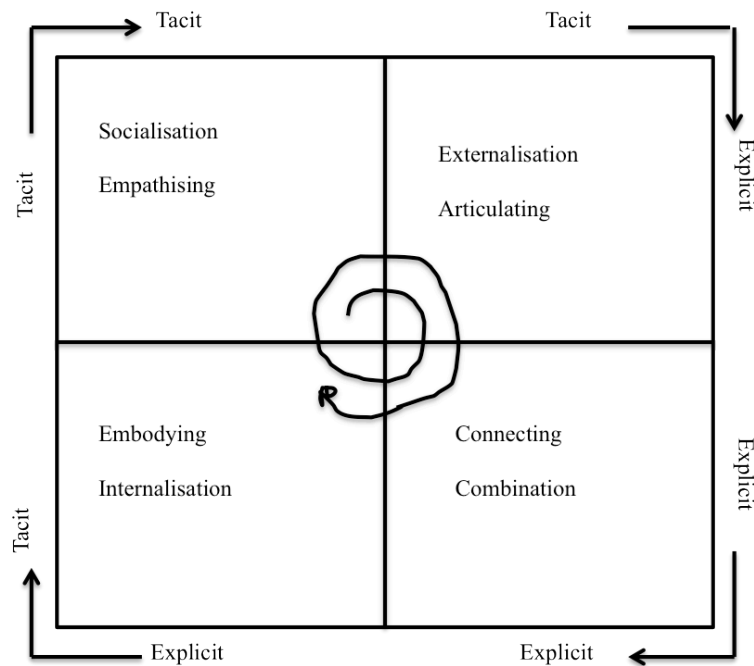


Figure 4. The SECI Process (Nonaka *et al.*, 2000)

From this point, the motivation of the current research is based on the Nonaka's approach (individualism/Collectivism). My belief is that Nonaka's theory is a remarkable theory among posited theories in the KBV. Although, SECI is discussed at organizational level but favourably it is introduced as a theory applicable at inter-organizational level in contrast to most other theories. According to Nonaka *et al.* (2000), knowledge "... can be interacted dynamically ... between organization and outside constituents such as consumers, affiliated companies or distributors." He then accentuates an example of a new manufacturing design software as it may changes the suppliers' manufacturing procedure which leads to a new round of product improvement in the main organization.

Nevertheless, some assumptions of this theory are criticized, and those include its functional limitations. One such assumption that is criticized by Kaufman (1994) is the concept of Ba⁴, which in a non-Japanese culture hardly can be understood. Nonaka and Konno (1998) consider Ba to define a commonplace or space for knowledge creation. It is the place where those who are in constant interactions process knowledge. However, since the concept is strictly borrowed from Japanese philosophy, the corresponding types of Ba are rooted in the cultural characteristics of

⁴ Ba is a Japanese word introduced by Kitaro Nishida and it is defined as "a context in which knowledge is shared, created, and utilized, in recognition of the fact that knowledge needs a context in order to exist" (Nonaka *et al.*, 2001).

those people who believe in it and for that reason this thesis does not follow that non-rational world.

The other critique is driven from Bratianu's (2010) article, which can be applied here to signify the analogy of "made with the flow of water". In fact, from fluid dynamics, flow is engendered by a pressure discrepancy. Looking into this knowledge dynamics model, no such thing as a pressure difference able to generate the flow of knowledge for understanding of what, where and how to support knowledge creation. In order to support knowledge creation, enabling factors should be introduced to enhance the model in theory and foster practices so that activities become more coordinated. To fill this theoretical gap here, knowledge capital including social and technological resources are introduced in this thesis to resolve this issue. While, social resources evaluate the role of individuals in managing knowledge, technological resources enable collative activities.

In addition, although Nonaka *et al.* (2000) highlights aspects of knowledge creation between an organization and its external networks, the author has not produced a model nor has he developed rich empirical findings for such a revolutionary model. Hence, development in the knowledge creation theory of the firm calls for an expansion of the abovementioned model in inter-organizational level in terms of the relationship that an organization and its individuals have within networks of external partners, such as customers and suppliers in an extended environment.

It is commonly observed that many firms have extended value chain collaborate to acquire each other's knowledge while other firms work together to introduce new products. The knowledge based view of strategic inter-organizational relationships as supply chain knowledge creation provides a suitable theoretical lens to understand contemporary knowledge based supply chain relations.

2.1.5. Getting Beyond Organization: Expanding Knowledge Creation to the Inter-organizational Level

Through the discussion of SECI modes, beside the organizational level, Nonaka investigates how an organization impacts on individual intentions to create knowledge. Yet, apart from that, even if individuals create knowledge it is not critically analysed how inter-organizational knowledge can be processed. How can someone decide whether or not an organization possesses knowledge creation within

its networks? Perhaps, in comparison with tacit knowledge, explicit knowledge sounds relatively easier to be conceptualized by managing documents inter-organizationally. This, however, is easier said theoretically than done in complex global network-based operations.

One might say organizations can employ agents, e.g. contractors, to audit inter-organizational operations (e.g. manufacturing know-how). Then, the question is how the agents' knowledge should be transferred to the organizational knowledge ontologically, and how organizational knowledge is supposed to be internalized to the individual knowledge. To support this perception, Vidal (2007) acknowledges the threat of misinterpretations of social processes in these indirect adoptions of practices. He highlights the importance of direct involvement of individuals in shaping knowledge and transforming the meanings into a shared frame of reference collectively.

In direct inter-organizational relationships, the sources of knowledge have two similar characteristics. First, individuals from different organizations create mutual tacit knowledge when they interact for collaboration on a project to articulate what they individually know, and they hear the articulation of other involved actors. Second, knowledge related to an organization's routines might be collectively transferred into explicit knowledge between organizations.

Scholars suggest further research not only on the likely impact of inter-organizational relationships on knowledge creation theory, but also empirically, there is a great need for organizations in a network to come closer to their partners for discovering the effectiveness of knowledge coordination (Hadjikhani and LaPlaca, 2013). Lawson *et al.* (1999) note that organizations do not act in a vacuum and their success depends greatly on other organizations in the broader environment. In other words, organizations are in need of corporate activities integration to achieve a competitive advantage over the networked involvement in peripheral operations (Hines, 2004). This statement is also pointed out in a paper by Hakansson and Ford (2002) that the characteristics of companies' relationships within their business network, i.e. suppliers and customers, influence their other relationships and also what happens inside the companies themselves. As knowledge and understanding develop within this network, it is argued that it may shape inertia to changes in the relationships, since the created knowledge will not be present in the new relationship and new knowledge needs to be generated.

Alternatives for expanding the theory to inter-organizational level

Prior studies have revealed that companies depend on knowledge derived from external networks. These include strategic alliances, open innovation, globalized markets and supply chain (Lindstrand, 2003; Ichijo and Nonaka, 2007) that can be studied in the context of a firm's boundary theories (e.g. transactional cost economies, resource dependency theory, strategic choice, stakeholder theory, learning theory and institutional theory). Nevertheless, since this study is oriented around the knowledge creation process, automatically, the focus is on the integration of resource dependency theory and learning theory where knowledge plays a crucial role (Barringer and Harrison, 2000).

Table 3 shows four categories of relationships that an inter-organizational research can be based on. The narrow net has a direct link to an organization, either vertically through a supply chain or horizontally throughout an industry while the latter goes beyond immediate links.

In addition, a network can be established around a specific plan, such as developing new product in supplier bases, or it may be fabricated around a broad plan (e.g. improving performance for the global achievements). Each of the four categories of relationships should be planned and managed in a different way so that with managing business process strategies, each relationship can be leveraged for a better knowledge flow (Ichijo and Nonaka, 2007).

Table 3. Categories of external networks for knowledge creation (Ichijo and Nonaka, 2007)

	Narrow Net (one step from company)	Wide Net (two or more steps from company)
Specific Mandate	Value Chain Relationships (Customers, Suppliers, Consultants)	Consortia Relationships (Board of Directors, Chambers of Commerce)
Broad Mandate	Industry Interest Relationships (Trade shows, Professional associations, lobby associations)	Interest Relationships (Charity events, World Economic Forum)

Since my research deals with the supplier-customer relationships, the first category is under scrutiny. When a retailer interacts with a customer or a buyer meets with a supplier, a specific mandate relationship is built. Ichijo and Nonaka (2007) argue this "...network is the both most widespread external network and the least utilized network for knowledge purposes."

To sustain organizational performance and cope with market changes, firms are forced to increase close relationships not only within the organizational level but also within supply chain (Hines, 2004; Corbett, 1999; Kotabe, 2003; Andersen and Christensen, 2005). Min and Mentzer (2000) mainstay this idea and argue that "the marketing concept, market orientation, relationship marketing and supply chain are not separate but inextricably intertwined".

Marketing specialists are strong to identify customer desires and managing relationships to at least retreat complexities in supply part of the global operations. In particular, the use of software programmes has enabled many organizations to gain an idea about customers' tastes by capturing data to segment the customer bases and to integrate marketing channels (Zablah *et al.*, 2004). Although using customers' opinions also makes it possible to apply marketing tools in a more lucrative way, when there is a lack of value chain force, they cannot compete on the low cost and fast delivery and consequently, customer satisfaction will be decreased by under-delivering and over-delivering (SAP, 2003).

In this situation, companies with coupled customer-supplier operations achieve the best results in meeting the predictions as also emphasized by Abery *et al.*, (2008) and Cummings (2006) to be "the key to delivering and sustaining business." In this case, the capability of creating profiles will lead to satisfying different customer needs and, accordingly, offering competitive prices to retain them and therefore achieve sustainable competitive advantage (Deloitte, 2002). This is to prevent the Musico's (2009) experience when he highlights statistics prove that across industries the likelihood of introducing new prosperous products to market are insubstantial. He refers to the failure rates of 80% when four out of five products fail. Likewise, in 2004, Mentzer *et al.* did a study on more than 400 organizations where the results have shown that the supply chain managers do not understand demand and demand management. As he mentions, they failed to recognize the importance of customers in the value chain. Analogously, Deloitte (2002) carried out another research on 249 managers across 28 countries and uncovers that only 17% of studied organizations

have successfully connected their supply chain and customers.

In particular, Hines (2004) discusses a case in the fashion industry and argues that, culture, income, population and technology direct customer behaviour so that predicting customer behaviour involves the potentiality to be convincing in communicating with society about their core values. By considering the different styles, habits, and skills of parties, arranged strategies are more likely to be implemented. Engle *et al.* (1995) details ‘cultural empathy’ in global business and defines it as “the ability to understand the inner logic and coherence of other ways of life. Consumer analysis focuses on ‘meaning systems’ of consumers in a nation that are intangible within the cultural context of that country.” Hence, modern business developments have been described by the strengths of their value chains, and the likelihood of operating well in current market is based on the performance of firm’s broader environment (Tang, 2006).

2.2. Leading Supply Chain Toward Knowledge Based View

2.2.1. Supply Chain in Current Trends

Previously, we have arrived at the conclusion that the integration of both the knowledge creation theory and supply chain perspective could lead to improve the picture of inter-organizational knowledge creation process since organizations might find it challenging, in the immediate future, to focus on improving organizational climate. I believe at the organizational level, the outcomes of the process might be slightly different from supply chain relationships. However, their overall organizational competitiveness will benefit by enhanced supply chain strengths and the other way around. Here, the attempt is made to review the supply chain literature in a way to acknowledge the missing linkage to integrate it to knowledge creation theory. Since then, the emphasis is on intangible assets i.e., knowledge instead of merely the flow of products.

In general, a supply chain is a set of activities in a business from buying the raw material from the supplier to selling it to the customer. The origin of the concept is not clear, but its maturity was along the lines of physical transportation and logistics, using the techniques derived from the work of Forrester (1961) on industrial dynamics (Croom *et al.*, 2000). At the early stages, there were only two actors involved in the chain but with the expansion of trade, the number of actors has

increased. In our time, the players of supply chain fall into six likely categories of raw material supplier, manufacturer, distributor, retailer, logistics provider and final customer. In more detail consideration, each individual role has its own supply chain in a less significant scale (e.g. the manufacturer has its own supply chain⁵).

In the early 1990s, supply chain management began to attract academics that tried to advance the explanation of supply chain and its management. Table 4 illustrates that some definitions mostly characterized the supply chain by scrutinizing product relationship management, which by far used to be the most prevalent explanation of flow of materials relating to the role of inbound and outbound functions and the way that changes the demand for specific types of requirements. Devised by Scott and Westbrook (1991), it is argued that in contrast to the well-known supply chain theory of Novack and Simco (1991), the linkage of elements in the production process is actually substituted routine tasks of managing flows of goods, leading to an increase in demand for producing more cultivated definitions (can be seen below).

Table 4. Early 1990's supply chain management definitions (Adopted from Jain *et al.*, 2010)

Author	Definition
Towil, Naim and Wikner (1992)	"The SC is a system, the constituent parts of which include material suppliers, production facilities, distribution services, customers linked together via feed forward flow of materials and the feedback flow of information"
Cavinato (1992)	"The SC concept consists of actively managed channels of procurement and distribution. It is the group of firms that add value along product flow from raw materials to final customer. It concentrated on relational factors rather than transactional ones."
Cooper and Ellram (1993)	"SCM is an approach whereby the entire network - from suppliers through to the ultimate customers, is analysed and managed in order to achieve the 'best' outcome for the whole system."
Berry et al. (1994)	"SCM aims at building trust, exchanging information on market needs, developing new products, and reducing the supplier base to release management resources for developing long term relationship."

⁵ The supply chain affiliates are the raw material provider, delivery service and end customer, which in this case is potential wholesaler.

Later on, Ganeshan and Harrison (1995) emphasize on ‘network’ and characterize it as “a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers”. Here, ‘network’ is a mode of organization that is based in the coordination through interaction and adaptation with other involved parties, which perhaps was learned from Hakansson’s (1987) network model to be integrated in the characterization of supply chain.

Since then, the explanation of supply chain management had not been much changed until 2001 when Mentzer *et al.* (2001) made an alteration in defining it. Based on their definition as quoted in Giunipero *et al.* (2008), it is a “systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within a supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole.” In this viewpoint, a supply chain covers a set of entities (organizations) involved in the upstream (customer-driven) and downstream (supplier-driven) flows of products, services, and information from a source (an organization) to a user (another organization).

Although Mentzer *et al.* (2001) clearly approach supply chain management in line with the requirements of establishing knowledge management at the heart of the definition, table 5 shows that the current literature has not proved the nature of dynamic relationships in networks in the last decade adequately.

Table 5. Supply chain management literature review

Author	Methodology/Scope	Results
Croom et al. (2000)	Reviewed 84 papers on SCM Time period not mentioned; journals and books	Primary categories in SCM literature are defined, including Logistics, Marketing, Relationships/Partnerships, and organizational behaviours; SCM literature can be classified in terms of the level of analysis (Dyadic, Chain and Network)
Giunipero et al. (2008)	Examination of 405 research articles	Many of the articles reviewed only looked at one-tier investigation. Several of the articles where multiple regressions would have provided in-depth analysis. Studies represent moment in time

	Publication after 1999 was brought into account	(longitudinal study would be far more informative). Lack of research for examining global SCM
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To expand the Mentzer *et al.* (2001) networked-based supply chain, as can be seen in table 5, Giunipero *et al.* (2008) conclude most articles suggested that future research should address networks interlinked with global supply chain management using case-based research that has not been extensively done by researchers.

In addition, apart from the need of studying supply chain in global environment, Frohlich and Westbrook (2001) call attention to the continued evolution of supply chain theory as it needs going away from data and information levels of integration (Mentzer *et al.*, 2001) to cover human-centric issues of knowledge in order to sustain constant improvements. The focus on ‘individuals’ is not against the weight of technology, which contributes in the conversion of individual resources into capabilities by way of pre-built integrated information systems (e.g. ERP and CRM). On the contrary, it is even in support of Serpny *et al.* (1999) as “the supply chain must be supported by strong IT and in particular by strong supply chain execution systems. These systems must be able to ‘talk’ intelligently to external suppliers and to facilitate communications within the company – and these include both supply chain communications and links to areas outside the supply chain itself.” This piece of evidence is probably miserable but routine jobs in a wide variety of industries characterized by often-repetitive tasks, thus, making it easier to be programmed into computers. By tradition, these tasks were the middle-skill jobs for the reason that they have need of an amount of training if performed manually, but currently are gradually being replaced by more technology.

However, Frohlich and Westbrook (2001) mean to identify the role of individuals to create knowledge, and sharing it as it may depends on individuals’ motivation as well as organizations in the network relationships (Lin, 2001). This leaves non-routine responsibilities which can be divided into two types of tasks failing at opposite sides of the skill continuum; those requiring non-representational skills, and the representational tasks that require hand-eye coordination or precise corporeal immediacy – unattainable to clarify into computers. This is a simple but illuminative example in ENC factory in Japan; the robotic assembly lines are being replaced by human workforce. At first glance, this might seem very bizarre, but the

flexibility of humans and each individual's intelligence are the keys to their superiority (to machines). With a general look at modern industries, it can easily be noticed that the era of standard production has given its place to intelligent production, where even producing a single-use plastic plate needs to have unique advantages in order to beat the competition, let alone producing luxury goods including fashion products.

This approach toward the definition is the missing linkage to integrate knowledge creation theory to supply chain management concept. This concentration goes beyond the tangible assets of the chain, such as material flow, but also on intangible assets i.e., knowledge (Choi and Hong, 2002; Malhotra *et al.*, 2005).

Nevertheless, as Verhees and Meulenber (2004) bring to light, the general research route on supply chain management neglects the impact of individuals. Authors still concentrate on knowledge from organizational perspective without turning to the importance of people-centred factors in creating tacit knowledge (Alavi and Tiwana, 2002; Burgess *et al.*, 2006). Similarly, Gunasekaran and Ngai (2005) note that the latest research on supply chain that contributes to knowledge management literature examine strategic planning of IT, virtual enterprise, e-commerce and IT infrastructure. For instance, they found that collaborative IT systems can be accessed by information sharing and partners' collaborative planning that can be used mainly through mechanisms such as process coordination and information integration. Likewise, according to them in the age of digital communication, the opportunity to use many pre-built integrated information systems, such as web systems, has been provided to control the different business units of a company as a unified whole which surpasses the competitive priorities organized by supply chain companies.

The fact is people are significant factors in the success of knowledge creation in supply chains and their existence is crucial since supply chains employ personnel who engage with the culture of their own organization. In this manner, they improve social knowledge and enhance the reliability between the employee and the corporate goals (Wilkins and Ouchi, 1983). However, it is difficult to push these diverse styles to work easily together and therefore partners have to use particular IT based mechanisms to exchange their ideas easily.

This combinative approach is seen more critical when in the global economy knowledge-oriented network approach associates with the fact that the whole world

has become the marketplace and it is no longer strange for a British food company to take over U.S or French counterparts (McNurlin and Sprague, 2002). Thus, the hypothesis is reinforced by globalization to lower communication costs which have allowed those habitual tasks to be outsourced to lower-waged destinations and therefore, vacating out the necessity for labour-intensive works in the home countries (Goos *et al.*, 2009).

So the question here is that supposing that the cost reduces with globalization of supply chain, what would be the fate of knowledge creation process? Would managing supply chain be more satisfying with diversification of workforce to generate new ideas, or on the contrary, expand the range of their activities to bring about disintegrality in technological or humanistic dimensions? In this thesis, these questions regarding the influence of knowledge creation process on complexities are studied and answered.

2.2.2. The Combinative View: Supply Chain Knowledge Creation in Global Frame

In this thesis, the main focus is on global changes and the acknowledgement of closely related supply chain changes in the response of global issues. Dicken (1998) contributes to the textiles industry by writing about the first manufacturing operations that has been globalized: “Indeed, global shifts in the textiles and clothing industries exemplify many of the intractable issues facing today’s world economy, particularly the trade tensions between developed and developing economies.”

However, there are various factors that can have an impact on the work of operations. Buckley and Ghauri (1999) provide various alternative causes of operational upgrading in global environment in their analysis of both organizational-level and inter-organizational-level evidence from empirical analysis to demonstrate that globalization tends to have an upskilling effect of tasks for the guest company since “the nature of most industries is global. Suppliers are sourced from a range of locations all over the world to make a product/service that is demanded by customers who may also be located globally” (Hines, 2004). Worthen (2008) notes the aforementioned justification and supports most articles suggesting that future research should address global supply chain management, and then defines it as where art and science meet for improving the mechanism of converting the raw components to a product at low cost with high quality and pass it to global customers on time.

Nevertheless, it is widely agreed that the production cost reduction strategy is the main encouraging motivator here and as a result, the vast majority of companies outsource part of their operations at least to lower the cost of manufacturing tasks. Cudahy *et al.* (2006) state that recent strand of literature has identified cost management as being complementary subject of empirical studies for authors, and validates his argument by indicating that Accenture's 2006 survey of 269 senior executives of European industry sectors proves that the mainstream of respondents (73%) has offshore their business and 75% of them intended more offshore operations in the next three years. This set up supply chain strategy in low cost regions with some complex of onshore industry groups with offshore sourcing of physical components is to gain the best of both strategies. But do they really cut the cost of supply chain if the production cost cut?

Complexities of globalizing supply chain

Outsourcing increases supply chain complexity since the popular low cost countries are far from the firms' origins. Thomas and Iyer (2006) support this and state securing sources of supply from countries with lower production and labour costs is of paramount importance for survival of a company. While the piece price of many technological components from China and India can be from 30% up to 90% lower than those produced in Germany and the US, piece price is only a partial cost that a company must undertake. A survey from PRTM determines most applicants expect that future business growth will come principally from international customers for made-to-order products but 85% of companies expect to face with severe supply chain complexities to respond to these requirements (PRTM Management Consultants, 2011).

There are, also, other problems allied with global supply chain that Accenture survey in 2006 was studied, and it is argued that the accomplishments in low-cost countries may be dissipated through shortcomings at work within the 'old, structured' operations. Organizations could possibly lose visibility and, therefore, supply chain management, resulting in unsteady customer service or unbalanced inventory. Furthermore, cost may increase in the outsource country and as Cudahy *et al.* (2006) report "a fast-growing market can turn a low-cost supply source into a mid-cost source almost overnight." Therefore, outsourcing to such regions requires precise estimates of the total landed cost to ensure efficiency. Aimi (2005) reacts to this

research and believes that what is noticeable in global expansion strategies is the rise of variability which directly affects the trade volumes. Thus, the management of inventory levels, lane congestion and capacity of production are far more complicated to keep the cost relatively low.

To have a competitive global supply chain, organizations need to overcome complexities with balancing between the cost and the required delivery time, quality, and service according to the requirements of the market. Cudahy *et al.* (2006) proposes conditions to guarantee the success of this focused management of total operational costs and indicates competency of supply/demand-matching. Flexibility and collectivity of operating structure, and the visibility of information-management are ways things shape up for a fast and an accurate outcome. Rizza (2006) stays in line with Cudahy and produces KIP to measure the accuracy of decisions to measure the supplier's success in implementing customer relationship programmes for reviewing the value of business between supplying companies.

One might say the complexities of global supply chains are the drawbacks of trading globally, but the fact is that they are true sources of competitive advantages if they are managed appropriately and based on rich well-linked networks of the involving firms (Jonsson, 2007; Ichijo and Nonaka, 2007). It is also proved by PRTM cross-industry survey which illustrates that the most successful organizations manage their supply chain complexities in their industry better than the rivals (Vickers and Kodarin, 2006).

The Necessity of Supply and Customer Knowledge

To overcome the supply chain complexities, there has been a considerable amount of research that carries different methods to balance the operations. The majority of current research suggests the implementation of agile supply chain, lean supply chain and total quality management (Garber and Sarkars, 2007; Manuj and Mentzer, 2008; Ishikawa, 1985) are crucial. 'Agile supply chain' is one of these methods and as it is claimed by Martrich *et al.* (2008) that it is a major strategy to enable the quick response to changes and agile supply chain is an enabler for "a flexible supply chain to improve its network design, create more flexible supplier relationships, simplify transactions processing, and improve supply chain connectivity" (Garber and Sarkars, 2007). Thus, it is market-sensitive, responsive to

real-time demand changes and IT friendly to ease knowledge sharing between supply and demand as joint product development.

Manuj and Mentzer (2008) refer to an empirical study which a leading retailer announced that the supply schedule to the stores is moving from a once-per-week to a once-per-day. The message was lucidly driven by management's frustration with stock availability. The investigation into the total cost disclosed that the cost of daily transportation would surpass £28 million per annum. However, Bruce and Daly (2007) doubt the importance of this study as high level of customer expectations; product customizations and global regulations may shrink the visibility across the whole pipeline. In other words, the agility of supply chain can be an advantage when managers consider that the production is in harmony with customer expectations.

The other popular method between supply chain contributors is the 'lean supply chain' which prevents the waste and therefore the preferable management of inventory by using pull system to simplify processes and optimize customer service, therefore, minimize total costs across supply chain (Womack and Jones, 1996; Hutchins, 2009). Abernathy *et al.* (2000) study a lean approach to analyse product replenishment in textile industry. They found that in order to transport the fashion products, companies use shipment marking. Again, the characterization of shipping does not necessarily lead to a more responsive model as harmonizing the supply with customer demand is not equal to providing the right offer to what the customer perceives. In other words, as Rainbird (2004) declares, supply chain competence by itself will not increase customer satisfaction.

While in the above methods 'agile supply' is a time driven strategy and 'lean supply' is a cost driven approach, 'total quality management' (TQM) is the third possible tactic to control the complexities. Here, quality is the competing factor in the value-adding process involved in the production and delivery of products (Ishikawa, 1985). Although adopting TQM would be an opportunity to guarantee quality that satisfies the end user but in supply chain, in internal relationships such a strategy diminishes supply chain production flexibility and agility for responding to demand fluctuation.

Here, I argue in order to overcome the supply chain complexities, suitable knowledge based strategy is required to integrate processes, technologies and people to transform the organization from 'product-centric' to 'customer-centric' strategy (Alshammari, 2009). Processes initiate proper systems, which are for the most part

computerized information systems to take action upon the strategies. Technology is the enabler of information systems to reach the corporate goals of the supply chain and also people who need to design process, make the most of systems to fulfil customer demand. Ledyard and Krough (2007) support this idea by stating that “to be able to quickly identify changes (in either demand or supply) and be able to rapidly disseminate this knowledge to everyone in the supply chain who needs to act upon it. The only way to do this effectively is by establishing the processes infrastructure that makes rapid response possible.”

Traditionally, customer relationship management and supplier relationship management were admired as a means of bringing global customers and suppliers closer to the organization. However, as we learnt in section 2.1, since information was key, they miss the most important source of value, i.e. the knowledge residing in them (Gibbert *et al.*, 2002). Equally, with the ontological approach to the knowledge, knowledge of supply chain partners (i.e., customer and supplier knowledge) go beyond that and discuss the case on both the micro level (individuals) and the macro level (customer and supplier base as a whole) comprising a wider range of less-structured information, which helps to build global insight into supply chain knowledge creation. Cudahy *et al.* (2006) stresses this point that knowledge “involves understanding specific customer requirements; tracking general market movements; and recognizing or predicting economic and political changes in manufacturing and supplier locations that could alter the low-cost-sourcing equation”.

Although, Wu and Shen (2006) mention that as companies are gradually becoming more interested in outsourcing, supply knowledge management (SKM) should be considered as a company’s core competency but valuable knowledge is not only limited to manufacturing suppliers. It is also available along the supply chain where other partners operate (Kluge *et al.*, 2001). Companies have to recognize which suppliers make the best contributions to the supply chain operation and which perform ineffectively. Suppliers with a good contribution have significant knowledge about the companies’ products/services and customers’ requirements. Therefore, it is an advantage to design products with their assist; e.g., it can be design improvements from suppliers planned to cut the cost of manufacturing (Paquette, 2008). In addition, Vidal (2007) exemplifies the US industrial relations to frame the effectiveness of training in problem solving and decision-making to achieve tacit and explicit knowledge of suppliers. Therefore, with the aim of improving the prediction of

purchasing performance by maintaining a network of global suppliers, a company needs to have deep knowledge of its suppliers to increase their performance and capabilities to meet short and long-term supply needs (Krause and Ellram, 1997).

Meantime, customer knowledge (CK) and the supply chain capacity to satisfy global customers are parts of the direct relationship of an organization to its external environment. The importance of customers to the organizations in the global market has created competitive rivalry over acquiring new customers and/or retaining/enhancing relationships with current ones. Customer-driven supply chains need to direct their competences to manage the knowledge of those who purchase their products/services (Baker, 2000; Davenport and Klahr, 1998). They use their power of communication with the aim of developing CK from information flow via advanced information technologies. Customer knowledge has gradually been more recognized within marketing as a key strategic source in any organization's success to improve innovation (Darroch, 2003) and therefore, to serve each customer in the ideal way to bring in their satisfaction (see de Viron *et al.*, 2011 for more examples).

According to Paquette, the joint process by which an organization manages the identification, acquisition and internal use of customer knowledge is referred to as customer knowledge management (CKM). It is within these processes that an organization and its geographically distance customers jointly work in partnership to combine their active knowledge to generate new knowledge. Musico (2009) and Campbell (2008) explain how knowledge resides in tracking habits: "understanding customers engages knowledge of their requirements, budget, buying habit, preference factors and values." Examples can be customer choices of extra features, new uses for existing products and knowledge derived from cooperative R&D (Paquette, 2008) which companies promote their customers from passive recipients of products and services to knowledge partners (Gibert *et al.*, 2002).

The argument for integrating inter-organizational relationships into knowledge creation circle using related concepts is the case to study its impact on more complicated networks. A stream of knowledge flow from the customer and supplier into production or service is required to be fully understood and synchronized (Lee, 2001). Moreover, the integration has to be examined across the entire supply chain (Kuglin, 1998). 'Supply chain knowledge creation' is the opportunity for involving valuable resources to create knowledge in a network of dynamic relationships between the individuals working for a firm, an organization, customers and suppliers.

It highlights the network ties, the configuration generated by the supply chain connections and interactions between supply chain partners to share codes and languages in a trustful environment to identify opportunities and feel obligated to use the opportunities in decision making.

2.3. The Fashion Industry: Contextualizing the Model

Since fashion represents billions of pounds in sales, it has been the interest of researchers in recent years including Stone (2005), Banister and Hogg (2007), Brun *et al.* (2008) and Corbellini and Saviolo (2009). However, the fashion supply chain is a challenging industry. It is known by its unique characters, associated with its attributes, such as fast paced, unpredictability, a highly changeable market and inflexible supply processes. Fashion products are highly seasonal and the sales time for a particular product can vary between weeks and months. As a rule, customers take the shopping decisions in stores and the lack of demand visibility may lead to a higher risk of imprecise forecasts (Christopher and Peck, 1997).

In recent years, customers are now more selective and while well-heeled people are looking for luxury goods (Brun *et al.*, 2008) which are priced as high (e.g. Alexander McQueen), or medium to high (e.g. Paul Smith), fast fashion apparel chains shorten the replenishment period to keep fashion-conscious shoppers revisiting for the medium-low (e.g. Benetton), or low (H&M) priced products (Corbellini and Saviolo, 2009). In the same way, Bechtel and Jayaram (1997) suggest further research on the necessitation of the supply chain relationships to begin with the customer. Fisher (1997) defines the concept of ‘market mediation role’ in order to integrate customer knowledge and supply knowledge to foresee changes in customer behaviour that take place within their lifestyle.

Fashion is what organizations insert into the market according to their supposed knowledge from customers. For example, clothing designers bring in a new style as a seasonal fashion and customers follow that. Hines (2004) argues “consumer behaviour patterns are changed not simply by consumers themselves but by professional purchasing and procurement officers of retailing groups who exert enormous influence over customer choice.” This argument can be the abhorrence to fashion companies who believe they are only acting in response to demand changes as this expectation is created by their ability somehow. The third view is in line with early fashion theorists (e.g. Blumer, 1969) who believe firms aim to produce similar

innovations, since the inspirational thoughts are “in the air” and fashion trends follow a natural harmony with time. Here, Perna’s (1987) statement connects these opposing ideas from the institutional viewpoint: “the press and the designers watch the buyers; the buyers watch the designers, who in turn watch the buyers and the press ... the buyers, the designers and the press combine to determine what fashion choices the consumer will be offered next season.”

Now, it is to decide on the operations by prioritizing cost, quality and lead-time; at one end there is the low-cost Asian factory to wed retailers with the standardized series support sales-driven powers, and on the other end western manufacturers demonstrate the high quality in short demands.

The supply chain scenario can be viewed in worldwide networks whereas, for instance, research, design and development are made in Europe, supported by global spread textile professionals. Raw materials are sourced in the Far East and accumulated in the central warehouse at headquarter locations. Assembling is performed in Eastern Europe and distribution to stores is conducted either centrally or at distribution centres. Quality inspection performs fabric conditioning (e.g., washing or testing) in Europe. For innovative fashion products, often weaving, knitting and finishing mills have to be involved directly in the development process that is followed by the transportation of products by logistics partners.

Overtime strategies have been seen to unfold and while many global operations make a company profitable, many more may be faced with bankruptcy because in the era of accelerating changes and complexities in fashion industry, companies must be fit to compete and make decisive moves to pursue sustainable growth. Today, there are new forces in play. The global landscape is undergoing a seismic change. Rapid technological evolution in fashion manufacturing is fuelling the radical transformation. At the same time, humanistic hyper-connectivity is shaping the social fabric online and off. Above all, long-term thinking and shared values will prevail and understanding knowledge-based terrain is key to owning the future. Inaction is the most dangerous course of all. While today's fashion forecasting can benefit valuable sources of practitioners' knowledge of fashion producers, customers or manufacturing employees (Stone, 2005), fashion supply chain has not been well treated in terms of academic research.

2.3.1. The Concept of Fashion

According to poles of sources, the term fashion can be characterized in many ways. From the economics point of view, fashion is a factor of non-natural obsolescence which forces people to replace what they own with new articles that may not be necessarily different (Locke *et al.*, 2007). At the same time, sociologists consider fashion a term of social interaction that is a sign of the sexual impulse (Dickerson, 2003) to contribute to customers' intellect of who they are and what they epitomize (Banister and Hogg, 2007).

It is an art because creativity is the basis for designing fashion products. Therefore, as noted by Anna Wintour, Editor in Chief of Vogue magazine, "you can't change fashion by parading twenty-five navy suits down the runway" (Jackson, 2007; Hines, 2004). At the same time, it is a science since fashion manufacturing is an undeniable part of fashion production. It is also both individual-driven, being always related to the designer's knowhow, and collectively related, since a huge number of customers are there to judge the designer's work with symbols. Indeed, clothing is a highly emblematic product category and this means that customers make assumptions on the basis of individual flavour. For instance, those who buy an item of Calvin Klein clothing are not likely to buy items just to keep themselves warm. "Wearing the Calvin Klein label hints at the sophistication and design consciousness of the consumer and the label might be worn to communicate an element of wealth in addition to an uncluttered lifestyle (the simplicity of the designs) ..." (Banister and Hogg, 2007; Hines, 2004).

Although in general usage fashion refers to clothing style and accessories (Fionda and Moore, 2009), there has also been strong trends recently to involve the term 'fashion' in non-clothing products such as dance, cars, haircuts, cosmetics, homeware (Stone, 2005), music, painting and many other products or services (Dickerson, 2003).

The Cambridge Dictionary refers to it as "style that is popular at a particular time, in personal appearance and especially in things such as clothes, hair and makeup". Christopher *et al.* (2004) define it as "...a broad term that typically encompasses any product or market where there is the element of style that is likely to be short lived". While the abovementioned definitions emerge fashion and style closely but not the same, some authors, including Jackson (2007), argue that "there is

not really any difference between fashion and style as [even if] fashion has no style it is always fashion”.

Either trend or fashion products carry a choice of attributes that can be influenced to impact the e-buyers, and gradually more moved to a mainstream of retail channel.

Colour, print, fabric, trim and styling detail are some of the characteristics a fashion manager could manipulate to impress customers. However, ideas come from a synthesis of influence that emerge from all the above factors collected from different marketing channels located in globally to analyse work of competitors, ‘out of season’ events which provide trends in advance, forecasting service providers such as catwaking.com, publishers such as Promostyl, particular textile events such as Premiere Vision (PV) and ready to wear shows (Jackson, 2007).

2.3.2. Fashion Supply Chain

Despite these theoretical disagreements, Cammett (2006) introduces fashion supply chain in five divisions; transforming raw materials into fibres; spinning thread and weaving fabric, assembling final products that can be away from the sale point; packing products to sales destinations that can be through intermediaries or trader channels; and, retailing. Generically, Cammet’s description is combined with Hines (1998) and Harrison (2007) to structure the fashion supply chain that can be represented in this research as it is shown in the following eight stages:

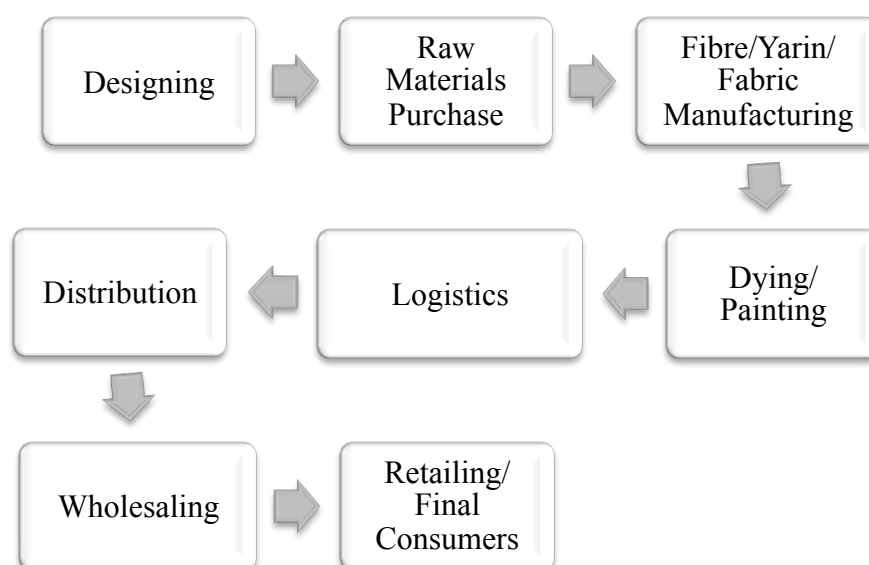


Figure 5. Fashion Supply Chain stages (adopted from Hines, 1997 and Harrison, 2007)

According to Raimondo (2004), the responsibility of designers lies in the ability to develop the relationship between what is inherent in the material and what we can overlay. The research about the characteristics of textile design began to appear in the mid-20th century as result of research into decision-making and innovation, as well as advances in technology for problem solving. Since then, major academic journals, such as 'Design Studies', and key research figures, such as Nigel Cross, remain leaders, especially in design knowledge research. Nigel Cross, in his recent book 'Designerly Ways of Knowing' published in 2007, studies design from an industrial perspective to build his arguments based on the failure to externalize the experience of designing that is not indicative of a lack of intelligence but a clue of intellect that expresses itself via alternative means that can be explained as tacit knowledge (Polyani, 1967). Less codified and less abstracted ideas (e.g. quantitatively rich and emotionally ambiguous) are difficult to peruse or understand.

Likewise, Moxey (2000) and Studd (2002) focus on how knowledge that fashion designers share is communicated in educational settings as a way of providing some insights into fashion knowledge and educational learning. Dormer (1994) agrees and continues that this tacit knowledge is intricate to be articulated and it can be demonstrated that it is likely to be utilized. He advises on the threat of reliance on tacit level and therefore pushes the value of questioning it. Shreeve (1998) also studies tacit knowledge in fashion design and she emphasizes the need for more extended research in an interdisciplinary research at the cutting edge of textiles as it serves the stretch of the 'design and emotion' where the specificities of design thinking and knowledge should be discussed.

Fashion design encompasses research not only in design but also technology, art and craft, signifying that this part of supply chain has formed both individual and collective tacit and explicit understanding of an exclusive blend of knowledge. I propose that in analysing fashion design knowledge creation process, it is important to consider the fashion design discipline as an entity, including fashion designers, designed products and the fashion design process. According to Archer (1979), an exploration of the applied methodologies of the process highlights how tacit knowledge is embodied in the designed products. It helps to understand how fashion design, as a design discipline and design object presents itself in the context of supply chain, are to be used to uncover design thinking and methodologies for processing design knowledge in empirical research.

The design stage is either completed in-house or ordered to a specialist design company. Either way, samples of the different sizes of products are manufactured to the retailers' conditions in terms of the specifications of kind and quality and are fitted before making the final decisions. Depending on the availability of technology resources, there is always likelihood of late modification. This process can take up to just less than 20 months before the beginning of a fashion season (Cooper, 2005). Thus, reduction of actual time for designing technological capabilities (i.e. CAD) help the company to make the pattern with the required measurement accuracy, shorten lead-time and enable automated storage of the design transmissions (Blackburn 1991; Cooper, 2005).

In the global supply chain, the manufacturing stage is a complex process, McMichael *et al.* (2000) categorize the manufacturing division of apparel processes in four stages (Table 6); fibre/yarn production, fabric production, samples production and apparel production:

Table 6. Apparel manufacturing supply chain (McMichael *et al.*, 2000)

Stage	Components
Production of Yarn	<ul style="list-style-type: none"> • Spinning of Yarn • Dyeing of Some Yarn
Production of Fabric	<ul style="list-style-type: none"> • Waving or Knitting of Yarn • Dyeing of Some Yarn • Printing • Finishing
Productions of Sewing Thread and other Trim used in making-up products	<ul style="list-style-type: none"> • Spinning and Twisting • Dyeing • Finishing (Lubricating Final Winding and Packaging)
Manufacturing of Apparel products	<ul style="list-style-type: none"> • Design • Dyeing of Some Garment Products • Printing of Some Products • Making-Up of Garments

Fibre manufacturing stands at the top of the apparel manufacturing. Fibres are either classified as natural fibre or artificial materials. It seems that creative design affects designers' material choices or the way in which they choose to develop a design idea. At the same time, the choices of materials essentially aid the fashion

designer in becoming more creative (Wilcox, 2002). Natural fibres contain fibres from plants, and animal fibres which are producible by agricultural firms since they supply manufacturing plants. Artificial fibres include nylon and polyester and require advanced knowledge and human competence. Hence, artificial fibre manufacturing is complex and limited to a monopoly of manufacturers such as DuPont, Maytex and Apexmills. In any case, spinners and texturisers change both natural and artificial fibres into yarn. In order to blend different sorts of fibres, the additional sophistication is needed (Cooper, 2005).

The fabric production stage converts the yarn into fabric by a weaving and knitting process. In order to clarify the importance of fabric production, Gale and Kaur (2004) discuss “when a fabric speaks louder than the garment it is transformed into, the scenario begs the question as to which leads which, does fashion lead textiles or do textiles lead fashion?”

In a weaving process, yarns are interlinked laterally and width-wise at accurate angles. Yarn can be woven simply or produce basic goods and then dyed for more explicit fabrication. Instead, dyed yarns can be woven. In knitting process, yarn is looped by spring needles. Later, the process can produce knitted fabric or dedicate in other apparel such as sweaters (Cooper, 2005). A typical process of fabric sourcing begins with an order for fabrics from a supplier. Habitually, the raw fabric is sent to a dyeing firm for advance treatment, which often is formulated by designers. After the finish fabric has been checked for material and visual requirements, it is transmitted to the raw material warehouse of the garment supplier. There, further tests are carried out. Ultimately, this fabric is transported to a garment-manufacturing hub where it can be cut into fabric cuts, which are coupled to the final product (Arschwager *et al.*, 2006).

For fashion supply chain, designers are extensively inspired by fabric producers’ creativity in order to get in line with customer taste and with their expressions through the cloths. This specifies that fabric producers have a key role to enhance the knowledge creation process by developing designers’ tacit knowledge as well as directing suppliers’ operational knowledge in the creation of “fashionable” products. It is based on their capabilities to present both technological and creative substances (Lottersberger, 2012). On one hand, technological substance is emerged by upstream actors (e.g. chemical component companies). On the other hand, their creative ideas for selecting collections in terms of colour (e.g. clay furrow), aspect

(e.g. light and washed out), and treatment (e.g. burnt out and washed) are highly invaluable for the competition in the market (Rinallo and Golfetto, 2006).

The next stage is the production of samples. In general, the very first samples are required to be approved by the manufacturer in the plant before being shown to the public by market representatives at important trade exhibitions where regular retailers and customers are invited for on-site exposition. Orders from buyers have to meet economical quantity before production takes place. However, unpredictability of customers' shopping habits, especially in the peak periods where there is manufacturing capacity restraints in plants, might cause complexity (e.g. ordering delays) during high-selling season.

To manage this complexity, some manufacturers do not commit themselves to requested annual production volume and produce more than the required volume of production (Hammond and Raman, 1996). Nevertheless, as a general trend, as fashion operations are linked, the production cycle is rapid with seasonal collection. Therefore, it is launched at least twice a year. For instance, fabric producers have to submit their proposals to their customers for the 2012/13 autumn/winter clothing collections in September 2011.⁶

Since apparel production is relatively cheap to set-up, this stage of the supply chain includes involving more manufacturing companies than in any other stage. Apparel manufacturing begins with the craft design of the article of clothing. Designers provide patterns which after the process can be used for cutting the fabric. The cut fabric is then accumulated into cloths (Cooper, 2005). This part requires intensive workforce. Knowledge requirements are not substantial at this stage which makes it appealing for business competitions (Berkeley *et al.*, 1999).

When order collections are made based on production volumes, cumulative orders are allocated to factories. The use of technological advances in this stage is mainly in pattern layouts for the cutting of fabric for the reduction of waste materials (Abernathy *et al.*, 1995). According to Cooper (2005), "in the sewing productions that follow, apparels are assembled with the progressive bundle system (PBS); a batch production system in which work is delivered to individual work stations from the cutting room in bundles. Sewing machine operators then systematically process them

⁶ Twelve months before final products become available in stores and since then the new product development is inevitably risky.

in batches.” The outcome is the large work-in-process (WIP) inventories and lack of flexibility leading to poor performance. Towards shifting the apparel more rapidly through sewing operations, particular clothing companies have started to employ Unit Production Systems (UPS) to reduce the buffer sizes for facilitation of their operations. An alternative way is to employ modular assembly systems (MAS) to operate in small group of sewing operations (Cooper, 2005). From this stage, the remaining supply chain operations can be discussed based on the following levels.

2.3.3. The Level of Fashion Industry

Apart from supply chain point of viewing the inter-organizational relationships, in fashion business, there is a special relationship that differs it from other industries. The industry operates on four levels; primary to secondary and from retail to auxiliary level (see figure 6).

For Stone (2005), at the primary level, the trained human force has a great importance. Here, the fashion raw material growers and producers are key members. The selection takes place twice a year in the collection performance of autumn/winter and spring/summer and the priority is set on quality and innovation. Generally, there is no use of machines; goods are imported from emerging nations where materials are usually processed by the earliest forms of industrialization.

The secondary level is composed of highly developed manufacturing applications which produce the semi-finished or finished goods from materials, produced on the first level. At the second level, customers have the option to decide on the desired items among a range of articles of different trends, sizes and colours. Secondary level companies work from six months to one and half a years ahead of the time when products should be available to customers (Dimitrakou, 2007).

The retail level is the ultimate distribution stage. Compared to the two other levels, at the retail level the production volumes are raised to millions of units at minimum cost as a result of the high capital intensity of a completely industrialized process. Moreover, the importance of design innovation and details are diminished here and therefore articles are mostly constituted from copies of the previous two levels. The relationships between levels are vertical here (Dimitrakou, 2007). To attract customers in the retail level, fashion firms categorize products based on length of Product Life Cycle (PLC), price, quality and process. Usually, men's/children's

products belong to the basic category. Since the women's fashion changes occur more frequently, women's merchandise directs fashion collections (Abernathy *et al.*, 1995).

Finally, the auxiliary level is the only level that simultaneously operates with other levels to support primary producers, secondary manufacturers and retailers. On the auxiliary level, all the advertising, consultancy and researching are carried out for marketing a new product or the supply of a popular product (Stone, 2005). For instance, at the auxiliary level, selected teams are employed to advertise the new products in one of the main fashion categories; basic products (such as underwear), basic fashion products (such as casual sportswear), high fashion products (such as casual suits), fashion collections (such as higher priced ready-to-wear fashion products), designer collections (such as exclusive ready-to-wear products), and custom-made products for premium customers (Cooper, 2005; Stone, 2008).

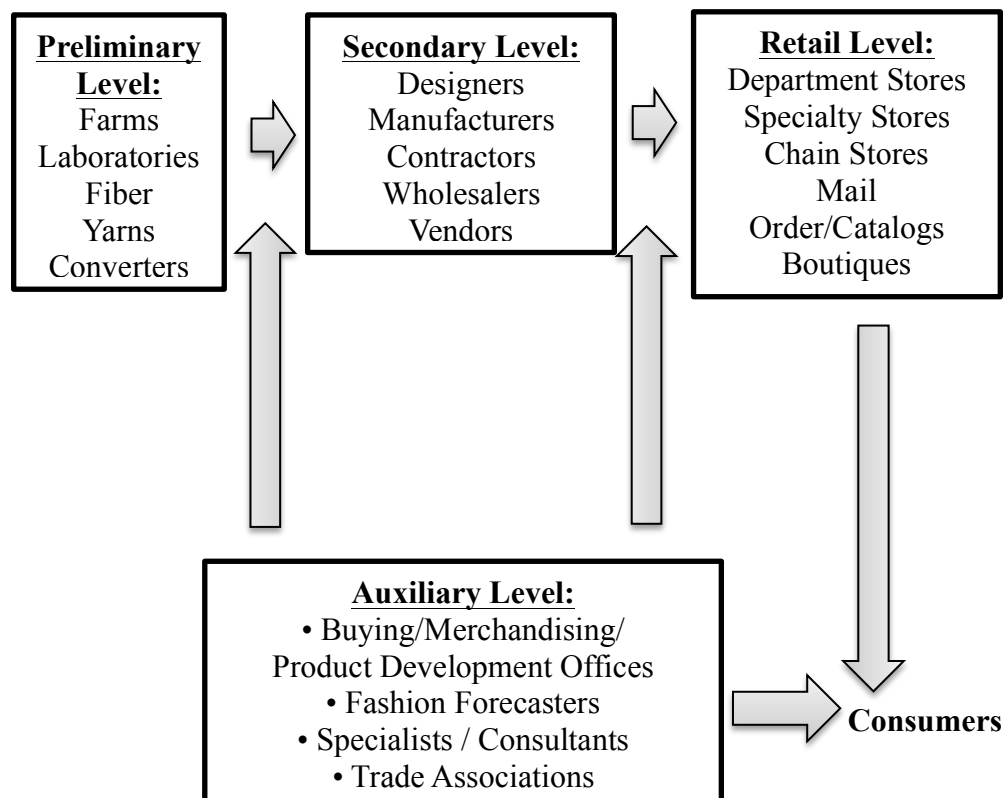


Figure 6. Levels of fashion industry (adopted from Stone 2008)

In order to examine supply chain knowledge creation, a temporal perspective is elemental to understand the changes that are currently happening in the textiles types, product development, global fashion markets, global sourcing and merchandising, fashion retailing and services, and how these elements are affected. These changes are affected by knowledge creation patterns in two ways; first, a new product is created

through adaptation of an experimental approach (i.e. learning by doing in internalization mode) and second, the creation of a product is resulted from unlocking individual tacit knowledge in externalization mode. These alternatives are detailed in depth in section 2.4.

2.4. Toward an Analytical Framework

Investigation of the present requirements of the supply chain points to an increasingly global and dynamically networked operation. It is relevant to this thesis because it provides the scene in which the actors who control the process work and therefore necessarily impacts how these relationships come about in terms of what is considered 'knowledge-based'. In addition, it offers an economical background as to how the concept of strategic decision-making has become a certainty, thus, we need to examine the management choices on utilizing knowledge resources. It is also entitled a need for comparison for these managers to differentiate them from their competitors as well as allies in the value chain.

Taking into account the literature covered here on the choice of knowledge based theories; it is necessary to frame a theoretical expansion for the thesis. As a starting point, take the study of knowledge, which was significant in pleasing both, a sociological and economical perspective on the values attached to tacit and explicit knowledge. This study aims to integrate a context which Nonaka and Takeuchi do not consider in the articulation of their theory.

Hence, I suggest that it is the acceptance of an ambiguously defined, if at all, SECI process orientation into the inter-organizational relationships, coupled with the lack of understanding of the supply chain complexities and provision of market in the fashion industry that motivates the 'supply chain knowledge creation' idea. This conceptualization has a number of advantages over typologies in the theorization of inter-organizational knowledge creation. This research allows for a perception of a firm's position within the supply chain as the product of its managerial strategic decision-making to fight against uncertainties and complexities which are the outcome of inconsistency in managing resources. Here, the managers' perceptions from tacit and explicit knowledge are recognized and their decision-making strategies are closely linked to personal dimensions, including organizational skills, physical experience and implicit rules. In line with Cudahy *et al.* (2006), systematic

organizational capabilities that can change over stages to form knowledge creation rhythms should be studied through socio-technical interactions.

To develop the interaction, as introduced earlier, the term socio-technical resources would describe an approach to complex supply chain design that recognizes the decision making process about the interface between social capital and technology as knowledge resources for creating knowledge. On the one hand, the social resources go through the survey of the human abilities, through the recognition of the potentialities in order to develop necessary activities. That is, the social resources can be considered as a fundamentally important tool improving the capacity of knowledge creation. The behavior, which is the experiential way of acting that helps in the task completion and the persistence, which is the application of the mental and physical assets for, determined aim (Davenport, 2001). On the other hand, technical resources are all kinds of collective capabilities owned by an organization, which support the social forces work productive. They can be reproduced and utilized to change knowledge into value so using the social resources appropriately to raise efficiency (Kakumanu and Mezzacca, 2005).

2.4.1. The Identification of Gaps in the Literature

Based on a study on supply chain knowledge management literature review, it is demonstrated that between 2000-2010 there were only a small number of articles addressing knowledge management and supply chain management at once. From this number, only one third of articles relied on the range as running from information to knowledge and from that point to knowledge creation. Particularly, “Knowledge Supply Chain” or “Knowledge Supply Networks” have used to emphasize not only the supply chain roles but also knowledge flows from stakeholders such as university and R&D centres in creating new knowledge (Marra *et al.*, 2012).

Nevertheless, the limitation of previous empirical studies, which correlate supply chain management and knowledge creation, can be classified in three categories. The first category of authors tends to involve one particular stage of supply chain (e.g. manufacturing or logistics) or one inter-organizational project between supply chain members or supply chain members and external partners. For instance, based on case studies in material purchase where organizations leverage purchasing authority for licensing-in connections, Choi *et al.* (2004) study corporate success in supply chain and draw attention to intellectual capital, licensing

relationships, as the basis in supply chain knowledge. The authors believe, as a part of the management of supply chain knowledge, licensees need to realize the challenges of licensing relationships. This is vital due to the fact that solid supplier relationships are of essence in supply chain. The paper concludes that although effective supply chain knowledge management is critical to managing operations, IP licensing responsibilities are not sufficiently incorporated with supply management tasks. The mind-blowing fact of this research is on the attention paid to know-how type of knowledge to be taken as a factor for comparing between traditional in-house operations with global competitive advantage assets in business market. However, while the process of knowledge creation is not analysed based on the SECI process, the clear discussion on licensing supply relationships kept vague when it arrives at demand characteristics.

Likewise, Niemi *et al.* (2009) analyse the underlying process of knowledge accumulation to support inventory management. The findings support the importance of organizational strategies over the technological advancement. This study defined two research approaches to knowledge management in a firm to support supply chain, namely knowledge maturity and knowledge creation. Two case studies are organized into two parts: first, the development to date; and second, the likely development strategies for the future. The outcomes of the case studies recommend that the selection between different strategies is closely related to the organizational cultures and environments. What makes this study interesting is the attention that the author paid to the complexity caused by knowledge maturity stages. However, the authors take downstream supply chain as the context of the study while no attempt made at any point to study the influence of upstream supply chain.

Similarly, Samaddar and Kadiyala (2006) once again concentrate on knowledge creation thoroughly with findings that indicate that ration between the leaders' and the followers' marginal gains. The authors explore the resource sharing conditions in which firms are encouraged to work in collaboration for creating knowledge. Using the game framework, collaboration for knowledge creation is modelled based on two scenarios, organizations with current efforts and organizations with prior efforts. In spite of the contribution of this study, the supply chain is analysed on dyadic relationship and therefore, the model does not prove the optimization process between supply chain members.

In the last example of papers of this kind, Xiwei *et al.* (2010) address knowledge supply chain networks and highlight the importance of each supply chain individual role in providing new knowledge. Nevertheless, this paper follows a risk evaluation method to illustrate the role of universities and research centres, which obviously are external to supply chain, in the success of supply chain. Taken risk as the main factor for studying supply chain knowledge shows that this research adds a less comprehensive look at supply chain than the two abovementioned studies, though its approach to external complexity in the real business environment is an advantage.

My research, instead, follows lead to push for a holistic view of supply chain knowledge creation, examining the operation of all aspects of the value chain in the fashion industry. It enriches both the knowledge creation of demand by understanding how customers access the market and the knowledge creation of supply by exploring elements of design, production and logistics which transcends inter-organizational boundaries in order to shed light on how this relates to supply chain positioning in confrontation with global business entanglements. In addition, by critically examining the involvement of partners in supply chain, I seek to provide a critique of limiting knowledge creation practice in organizational level.

The second category of authors restricts the implication of knowledge creation in supply chain relationships since they use a mixture of knowledge creation theories to contribute to the literature. The paper from Khalfan *et al.* (2010) strives to include knowledge creation and supply chain management in construction projects for improving performance. The authors particularly concentrated on knowledge capturing and knowledge transfer techniques in order to find that these applications enhance the veracity and the integration of the supply chain performance in construction industry. This paper identifies the benefits of integrated construction supply chain management through knowledge management. The paper appraises the general literature in construction supply chains and it highlights a few initiatives in the aforesaid topic, followed by comprehensive analysis and a case study. The case study is conducted in a public sector client firm in North West England. It also studies the employees' knowledge reuse. The authors brought to a close that knowledge management would improve the integration of construction supply chains in practice and as a consequence it improves overall production performance. Nevertheless, this paper suffers from having a significant distance from any knowledge creation theory to build a framework on.

In this sense, in contrast to the Khalfan *et al.* (2010) approach which confusingly employs a mix of knowledge management theories in studying supply chain, I aim to contribute to the literature specifically on that which looks at the way supply chain partners and their global networks accrue knowledge creation in the operations through accumulation of knowledge resources with respect to the characteristics of Nonaka's knowledge creation theory.

And lastly, in the third category, while authors refer to supply chain knowledge, they misidentify the role of individuals to create knowledge. Therefore, the creation of new knowledge only resulted from technological advancements in the network relationships (Lin, 2001). For instance, Corso *et al.* (2010) carry out a case study on the applications of knowledge management in the supply chain framework in the Italian food industry. This study deals with inter-organizational knowledge management in the Italian food industry. Based on qualitative study, the paper identifies the need for knowledge involvement amongst supply chain partners in their collaborations. Effectively a framework is conceptualized to look into the likely methods that Information Technology (IT) based solutions for supply chain management fulfil the knowledge management needs. At last, the knowledge management, enabled by the IT-based solutions, is assessed in terms of supply chain performance. The findings of the paper show how a single IT-based solution could facilitate supply chain to fit all the knowledge management needs. However, their definition of knowledge is partial since their reliance is upon the power of organizations to produce and share explicit knowledge solely. In other words, the authors of this research ignore the most important part of knowledge, socialization, where IT-based solution has a restricted involvement in its creation to be in line with Nonaka's and Takeuchi's research objectives.

Similarly, the work of Piramuthu (2005) concentrates on order characteristics in an automated supply chain framework. This framework is for reconfiguring a supply chain as per the stated of order terms. The results indicate an improved performance both in terms of the fulfilment of orders and the total financial profit. Although Piramuthu's research targets supply chain in detail, in the framework it is assumed that there is always a leading node in the upstream chain based on explicit knowledge while tacit relationships, such as inherent social capital among nodes across the supply chain, are neglected.

Lastly, Wu (2008), through Nonaka's SECI modes, analyses "how" customers, suppliers, technology and organizational conditions in two manufacturing supply chains affects knowledge creation process. The results of his study clearly illustrate that these factors facilitate SECI process to create supply chain knowledge. The most rational aspect of Wu's (2008) work to this research is his examination of Customer Relationships Management (CRM) and Supplier Relationships Management (SRM) and how these variables are related to four types of SECI process. However, while his invaluable effort to link supply chain factors to knowledge creation is undeniable, as discussed earlier, his reliance on CRM and SRM misses the most important source of value, i.e., the knowledge residing in supply chain players (Gibbert *et al.*, 2002) that can only be studied in line with CKM and SKM concepts.

In this case, for this thesis, results are determined by experiment and observed behaviour of individuals about how knowledge creation is employed, issues of technology management and social involvement in the analysis that informs observations on such data, allowing for an in-depth understanding of how knowledge is co-created, if any, and if not, what barriers are on its way (e.g., economical factors).

This thesis also seeks to add to debates around global impacts by critically exploring the methods used in the research presented here and treating the issue of time, cost, and quality and their impacts on the constructed nature of supply and demand and their role in the construction of different scenarios. Therefore, it is hoped that this research goes beyond the immediate influence of individual work to the analysis of the ways managerial decision-making in different cases unpick the relationship between strategies on delivering products and services.

This research argues that tacit knowledge has an explicit side, as it deals with reasoning that is approximate between tacit and explicit based on conversion possibilities within dynamic networks rather than fixed and exact values. Variability in these networks parallels the current changes in the global supply chains discussed in this chapter. Previous analyses of knowledge creation, including the study of Nonaka and Takeuchi (1995), do not convey this variation as a feature of supply chain knowledge whereas beside the technological involvement in detailing process improvements, supply chain behaviour is sent to be studied for evaluating the level of humanization of work where both mental and manual activities of workforce can be critical.

2.4.2. Moving from Ideas to a Theoretical Contribution

Figure 7 is a theoretical model formulated based on a review of the literature to facilitate the foundation of the methodology chapter and to conduct the empirical part of the study. The purpose of this framework is to guide the data collection phase and provide a framework for interpreting the findings. By having this model in hand, I will search for the elements of complexities in each supply chain stage and comprehend the availability of knowledge resources to process knowledge creation. Niemi *et al.* (2009), in previous research on supply chain knowledge, state that “a formulated theory development prior to the collection of data is essential to provide guidance as to what data to collect, but the long term involvement and observation of the researchers in the development process of inventory management in the case companies has also contributed to the development of the framework”.

In the following figure, the scope of the activities regarding the likely interdependency of knowledge creation process into supply chain context appears clearly. Considering the context in which this thesis is undertaken, it is much clearer how far this research takes its readers confidently so it enables them to compare the examples of the phenomenon portrayed here with those that have been emerged from knowledge management literature.

Based on the figure, this research examines the recognition of knowledge creation through incorporating the process into routine supply chain operations to acknowledge the likely complexities. Then, managers who are in the decision-making position are studied to understand their reliance on the types of knowledge resources for managing supply chain knowledge creation. This framework is to be used dynamically in a feedback loop to form the requirement of knowledge creation returning to its cause that is decision making in this particular case.

In this thesis, supply chain knowledge creation means the creation of knowledge, which is remediated by social entities such as division of labour, as well as symbolic tools such as concepts and computerized instruments to solve complexities in dilemmatic situations all over the chain. Particularly, in the fashion industry, this thesis takes the subject beyond the monopolistic approaches and studies individual players in the industry as well as the competences of knowledge technical support to follow the reality of the business as it introduced by Gale and Kaur (2004): “Technological advances, sophisticated consumerism, changes in society and lifestyles, diverse innovative thinking and media and communication touch not only

textile practice and philosophy but also the wider sphere of [fashion related disciplines] in general”.

In the following figure the main themes of the research are represented to illustrate relationships required for attaining supply chain knowledge creation.

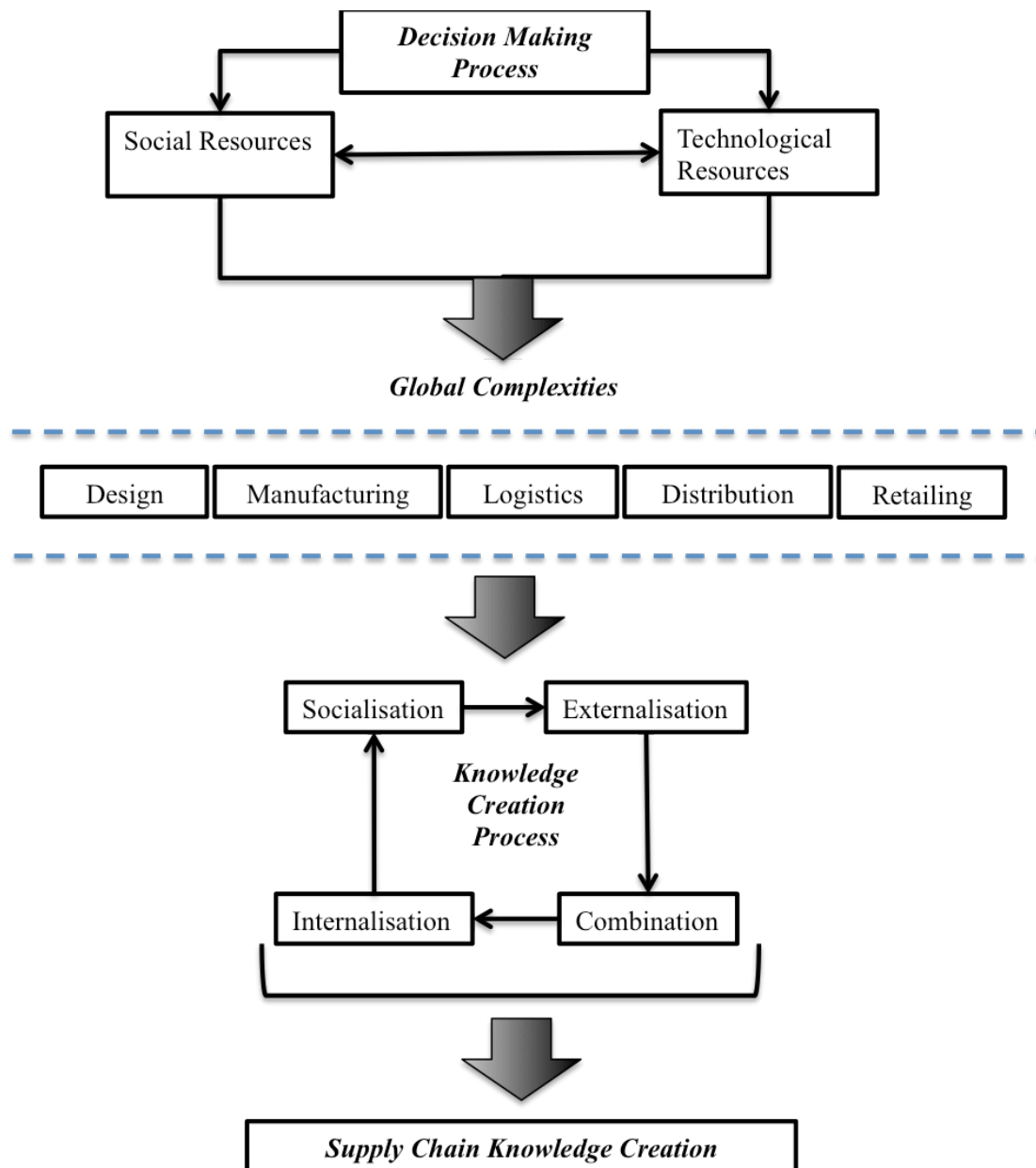


Figure 7. Supply chain knowledge creation framework

The research objective was to understand knowledge resources as they affect complexities in supply chain management. The hypotheses are that linkage from supply chain knowledge creation may be reduced the complexities as companies shift from organizational knowledge creation to inter-organizational knowledge creation,

when firms have more integrated operations and less subsidiary autonomy and embeddedness. These initial hypotheses are, however, simply a springboard for designing the study so that to have a view of adopting supply chain knowledge creation theory in which responding to empirical conditions. In this scenario, backward linkages played an important role.

After emphasizing the importance of use of resources, it becomes essential to also consider management styles. As noted in the literature, the supply chain is becoming increasingly global and most studies on fashion industry now consider a global perspective. Although scholars have been giving a credit to analysing this newly emerging subject, there is very limited academic research on this market. By taking a global perspective and comparing three leading European companies, this study will discover whether or not companies are able to process knowledge creation in a similar manner in entire supply chains.

Nevertheless, regarding the examination of an expanded version of a theory which was practiced successfully, it is necessary to have a preliminary understanding of whether or not it is possible to promote this approach to push organizational knowledge creation theory in inter-organizational level (theoretical contribution) within the fashion industry (practical contribution). This clearly shows the significance of this thesis in two different ways. Firstly, if knowledge creation theory was introduced in ‘white room’ conditions and it studies the organizations in a controlled research environment, in global supply chain environment, the scenario is modelled with complexities of doing business in global value chain. Secondly, based on Norman (2011) “when researchers well versed in experimental methods attempt to study practices, they discover that the very nature of a practical discipline throws in so many idiosyncratic variables that rigor is simply not possible”.

The empirical studies will collectively shed light on the importance of internal organization system on supply chain strategies as it forms the basic foundation of the collective culture. To introduce effective supply chain knowledge creation, developing the conditions for suitable circulation of individual power and well-aligned integrated knowledge management systems will reduce supply chain challenges and improves aggregate outcomes. By right planning, structure, and strategy formulation, firms are bound to achieve a significant amount of improved supply chain knowledge process.

2.5. Conclusion

As has been articulated throughout this chapter, the purpose of this literature review has been a threefold focus on knowledge creation, supply chain management, and the fashion industry, which focuses on various models and theories that aid in linking them together to understand the knowledge gap, and therefore the contribution of this thesis. The major theme that emerges in this review has been found to be the importance of supply chain knowledge creation in a firm's daily operations as they can be the basis for emerging competitive advantage in each stage of supply chain (e.g., design, service and production abilities). In line with previous studies, it has been demonstrated that there is a need for a clear conceptual understanding of the knowledge-based supply chain. The knowledge gap combined with calls from researchers to produce new multi-functional perspectives into supply chain literature indicated the importance of this research to integrate supply and demand for studying complexities.

The first step in taking the theory to the real world has been discovered to be theoretically synthesizing this conceptual model within the supply chain literature. Based on the introduced framework, in empirical terms, the companies are considered expert in the creation of supply chain knowledge spiral if the practical synthesis includes tacit knowledge and explicit knowledge, operating at various levels (individual, group, organizational and inter-organizational) and across departments, divisions and inter-departmental projects and layers (top-management, middle manager, store manager) within supply chain. In contrast, viewing supply chain as a static organism with leaner relations among the partners, focusing only on seeking knowledge rather than justifying the idea behind it and concentrating just on existing inter-organizational structures rather than on self-organizing teams uncovered to mean that the supply chain is not competent enough to process knowledge creation model as theorized.

The following chapter will set forth the methodology that has been chosen for this research, arguing that a qualitative research pattern combining observation and interviews is the most appropriate method for an examination of the dynamic nature of fashion business.

3. Research Methodology

It is identified in the literature review that inter-organizational knowledge creation suffers from a lack of detailed study about how supply chain complexities could be managed by the functional involvement of knowledge resources. This chapter aims to elucidate the preference of methodologies and the modes of implementation. In order to locate the purpose of this study in the right methodological order, the previous studies of the integration of supply chain and knowledge creation, which were summarized in Chapter two, are discussed here again to situate the thesis within industry-wide research. This could be achieved by investigation of internal dynamics of the relationships. However, as the industry operates in rather variable systems, and there is a mixed strategy involved in the operational level, it is important to decide on a boundary for conducting research. As illustrated in the conceptual model, to understand the process of knowledge creation, the concentration is on the actors who have influential roles to contribute to the conversion of knowledge in the supply chain (e.g., design, manufacturing, logistics, distribution and retailing) either by their direct personal involvements or by combining knowledge into the organizational knowledge systems. To analyse the case studies including Debenhams, the British fashion department store, the Italian Benetton, and the Spanish Adolfo Dominguez as considered for the analysis in this thesis, the paradigm of research, methodology, data collection method and the choice of analysis methods are described.

3.1. Research Paradigm

To accomplish a study, different approaches may be introduced in order to find an appropriate research pattern. Field (1998) explains that the very act of undertaking research sometimes implicates opposing assumptions about the nature of social actuality. Patton (1990) defines a paradigm as a biospheric view, a set of propositions that clarifies how global complexity is observed. It articulates what is imperative, what is authentic and what is practical (Quoted in Taylor, 1996). This can be seen in a work of Patton (2002) who outlines a paradigm as a set of intentions that clarify the likelihood of perceiving the complexity of the world. It articulates what is significant, reasonable, and rational, in order to understand the responses to three ontological, epistemological and methodological questions (Guba and Lincoln, 1989).

Based on that, to set the philosophical stance of a study, firstly the ontological question, i.e., what is the form and nature of reality is a crucial part to guide a researcher toward an explicit order of a concept (Gruber, 1993). Secondly, there is the epistemological question of the basic belief about knowledge. In other words, what can be known about the nature and the origin of knowledge (i.e. we know what we know) (Dawson, 2002). Thirdly, the methodological question is set forth to demonstrate how a researcher goes about finding out whatever she/he believes.

As a result, the methodology of a research is the adopted principles to attain the research goals and objectives and this can be appreciated in Dawson's (2002) three methodological concepts; "1) the analysis of the principles of methods, rules, and postulates employed by a discipline. 2) The systematic study of methods that are, can be, or have been applied within a discipline or a particular procedure or set of procedures. 3) Methodology is the philosophy or the general principle which will guide your research."

Once the dimension of a research paradigm is implied, it is the researcher's choice to locate the study in a category of research paradigms. While the number of choices is quite few, in social science studies the most cited papers are fallen into positivism, interpretivism and critical theory (Denzin, 1989). A French philosopher and sociologist, Auguste Comte, turned out the term 'positivism' and describe it as ontology of nominalism based on observation arguing that the only definite knowledge derives from experience. It supports researchers to create general theories which potentially can articulate relationships between phenomena and observation (Abercrombie *et al.*, 2000, cited in Thomas, 2004). In positivism, humans are recognized as 'natural objects', similar to trees or birds. Therefore, they have an existence and specifications which make them independent. Nevertheless, a positivism paradigm does not suit the objectives of this thesis since knowledge creation is related to human behaviour to a great extent. Particularly, dealing with humanistic mechanisms allied with the concept of supply chain knowledge creation, it is more subjective than objective. I follow Banks' (1998) study that criticizes positivisms as it is failed to comprehend the unique socio-cultural contents that exist in a multinational society and therefore positivism, which sounds suitable for the behaviourism as a theoretical orientation, neglects the acknowledgement of the none-observable mental states (Thomas, 2004).

In contrast, the second alternative, interpretivism, investigates the understanding of social world with close reference to its relevance to actors. Based on this paradigm, the entire meanings should be revealed by the observer and then interpreted along with the framework in which they take place as this world is meaningless unless "people construct meaning and social reality" (Berger and Luckmann, 1967, cited in Thomas, 2004). In this case, the researcher has to be involved in the examination process with their unique perceptive interpretation aptitude. But, how far can the nature of a mere participant's understanding guide the assumptions of knowledge in this research?

Similar to interpretivism, the third alternative, critical theory, has a subjective epistemology as opposed to positivism. Initiated in Germany in the 1930s, in the critical theory the focus is on the evaluation of variations to exploit effecting changes (Kincheleo and McLaren, 1994). While interpretivism, for the most part, discovers human incidents and interprets those incidents in order to shape a meaning that can be used as a new theory, the critical theory concentrates on developing new theory by assessing the existing theory (see Section 2.4). Thus, according to Kincheleo and McLaren (1994), employing critical theory would increase the chance of uncovering the structures, processes, and cultural factors that help in particularising incidences.

In this category, theory development relies on some very specific theoretical concerns. As this study calls on approaches that discourage the first two paradigms to uncover a reason for criticizing the nature of existing societies, the critical theory is employed here⁷. For instance, in managing knowledge creation, the staff should act freely from the individual's restrictions. This is to raise autonomy in their individual needs for uncovering the structures, processes, and cultural artefacts that support their domination, with oppressed teams becoming emancipated.

3.2. Research Methodology

While critical theory has been chosen as an appropriate paradigm, now choices of research methodology should be known. As stated by Schwandt (2000), research methodology is 'processing inquiry' which involves analysis of the

⁷ Positivism is based on experience and visible characteristics, while if a reason is not visible; it is unacceptable in the critical theory.

principles and procedures. While during the last decade, the large number of methodological approaches taken to study knowledge management by using large quantitative sets of data (Ordenez de Pablos, 2002; Hult *et al.*, 2004; Craighead *et al.*, 2009), an increasing number of papers proposed how the future trend should be regarding replacing quantitative with qualitative approach (see Giunipero *et al.*, 2008 on table 5).

This orientation follows the fact that the use of explicit knowledge in the enhancement of performance for managing supply chain management (cited in Marra *et al.*, 2012) is defenceless when it comes to tackling opportunities given by knowledge management for supply chain practices. If the proposed ideas were looked at in the continuum research and in a comparative manner, more realistic outcome would have been produced to show the effectiveness of individuals' tacit knowledge in guiding patterns. Therefore, by looking at existing trends, especially to determine trends in manufacturing operations, the aim is to rather link previous findings with new conclusions (Marra *et al.*, 2012). In particular, in some ways, this research follows Niemi *et al.*'s (2009) methodology in study of inventory management techniques which argues that for a study of multiple global manufacturing facilities and technical retailing, qualitative methodology works best to examine social mechanisms.

In line with that, Hair *et al.* (2003) portrays the qualitative research as "discovery oriented, uses the data to generate ideas, and is based on inductive reasoning to answer how effective an individual is in identifying patterns within a large amount of data." From the literature, there are a number of methodologies suggested for qualitative studies. In what follows, the most popular methods are action research, ethnography, grounded theory and cases study which presented in more depth here to assess the suitability of each one in gathering, analysing, and mapping the data in the accomplishment of the aim of this research.

According to Somekh and Lewin (2005), Lewin (1988) conducts the earliest action research in the 1940s and 1950s to pave the road for those researchers who want to get involved in real-world issues to tackle the challenges. Here, the main goal of action research is contributing in activities with a group of people. This supports the researcher to have quicker insight into circumstances, recognize problems and try to discover right solutions for them or at least recover the present state of affairs. In a supply chain knowledge paper in 2009, Niemi *et al.* refer to the appropriateness of

action research in proving a similar choice of contribution for managing inventory and discuss that action research provides the opportunity to observe an organization in a way that would not be possible for those who do not participate. He adds, in addition, it ensures the track of research to be of ‘guaranteed managerial relevance’, seeing the managers’ involvement in the research and therefore the possibility of revisiting the company when they are no longer directly involved. While all the abovementioned proofs can be seen in the analysis of case study research, there are two main concerns allied with this research methodology; ethical issues and practitioners’ enthusiasm to collaborate with the researcher. In order to avoid ethical issues, most companies have a preference to let their employees conduct the entire research process. In addition, on the way to diminish practitioners’ resistance to collaborate, the researcher has to consider a group of practitioners who are eager to collaborate in the research and eagerly accept new ideas (Dawson, 2002). Likewise, action research cannot be the most appropriate solution since derived from Lewin’s model, it frequently does not start with a question (cited in Somekh and Lewin, 2005). Instead, the situation that the researcher begins to contribute will act as the guidance. Similarly, contributing in the various activities of fashion characteristics is almost unattainable in this short period of a PhD programme.

Based on the literature, the second well-liked methodology is ethnography, which roughly means ‘writing about people’ (Somekh and Lewin, 2005) while methodologically it means “a qualitative description of human socio-cultural phenomena, based on field observation” (Hair *et al.*, 2003). In order to conduct this research methodology, the researcher requires becoming a part of the ‘lives, culture,’ (Dawson, 2002) and also ‘community’ (Hair *et al.*, 2003) of the group to observe the behavioural and cultural meanings to interpret his perception. Even though the cultural influence and its likes are deemed in this thesis, this research is projected to study three supply chains with the purpose of presenting a general view of supply chain knowledge creation. This is in line with Somekh and Lewin (2005) that argue ethnography studies are usually conducted in one case to provide an exclusive overview.

To describe the third widespread method, i.e. grounded theory, Dawson (2002) indicates that the aim is the likelihood of developing a new theory rooted in the results of a research. In this methodology, no predefined models are characterized for the testing purposes (Dawson, 2002). Thus, the researcher begins the research with

a wide view of the concept and raising broad questions. Then, these general questions guide the researcher to ask over more detailed questions (Somekh and Lewin, 2005). These concepts are the basis of the new theory that can be formulated in the end. Since the purpose of the grounded theory is to build up a theory, there is uncertainty about the precision of number of cases and people that need to be involved at the beginning of the research until the saturation point when no new information is provided (Dawson, 2002). Despite the truth that grounded theory is appropriate in developing current theories and building new theories, its data collection method is not well matched with the objective of this study. Knowledge creation in inter-organizational relationships is a broad area of research and implementing grounded theory as the research methodology may repeat a large amount of the research particularly when it needs unfixed numbers of interviews to arrive at the saturation point. Accordingly, if the researcher arrives at the saturation point in the early case studies, data collection has to be congested. Alternatively, if this study does not arrive at the point of saturation after the last case study then the data collection should be continued. This is in disagreement with the goal of this study, which is to interview a certain number of people in an allocated period of time.

Lastly, Yin (1994) delineates case study as an experiential investigation that follows a current occurrence when phenomenon and context have unclear boundaries. In accordance with him, there are three types of case study methodologies; ‘exploratory’, ‘descriptive’, and ‘explanatory’. These types can be differentiated by the nature of the research question, extent of control the researcher has over behavioural procedures and the level of focus on existing events as in opposition with historical events. For instance, in this research the main research question is on ‘what’ which it is an exploratory research. Apart from Yin, many authors write about the appropriateness of case study methodology when there is a need of an in-depth research study (Ghauri and Firth, 2009). A qualitative case-study methodology is mostly valid when conducting network research on companies (Jansson *et al.*, 1990) and it is particularly useful when the research is difficult to be known outside its natural box and so concepts are difficult to quantify (Ghauri, and Gronhaug, 2010). In this methodology, the assumption is that the ‘social reality’ is formed through social interaction, though it is placed in defined contexts, and the researcher tries to explain prior to analysing the study. Therefore, data must be acquired together with the documents previously analysed. This methodology improves information that can be

accessed in a particular case, such as the managerial aspects of knowledge creation in supply chain context in this thesis.

Nevertheless, case study methodology has been criticised by some scholars as being subjective, since they argue that researcher's expertise is an important part of the case study approach. It is the researcher who decides about the questions to be asked and how to extract useful information from the answers (Hodkinson and Hodkinson, 2011). However, this method, the same as other qualitative methods, demands researcher objectivity, insisting that they should not invent the viewpoint of the interviewee, if they want to comprehend their actions and reasons. Hence, these methods can collect data, which are accurate in the sense that they are centred on careful, close-up observation of what is being studied, in order to get the story correct, rather than only on inference and remote indicators; they are also precise as they are ready to consider the matters not predicted in the original problem. Furthermore, they provide analysis, which is full, in the sense that they are founded on knowledge about a wide range of issues on the question under study rather than just relatively few variables. Therefore, considering the abovementioned, it can be seen that qualitative methods can actually produce more accurate and rich qualitative data (Becker, H.S, 2001).

Another issue about case studies is discussed by Yin (1994) that case study provides little foundation for generalisation, as it is not likely to generalise from a specific case. However, it should be noted that in practice, what "generalisation" is meant to quantitative and qualitative researchers are quite different; while quantitative studies expect to discover findings that are generalizable to the relevant population, qualitative works seek to understand the underlying values, behaviours and beliefs in the research context. Therefore, the objective of qualitative work should be to achieve "theoretical generalisation" (Macao, 2007). In order to come to this kind of generalisation, and to mitigate this limitation in this research, a few different tactics including triangulation, theoretical sampling and variation have been used. Triangulation (cf. Denzin, 1970) was realized by combining three cases to come to a more secure and general results; It has been shown that if a researcher implements multiple case studies then the problem can be solved to a certain degree. Herriot and Firestone (1983) state, "the evidence from multiple cases is often considered more compelling, and overall study is therefore regarded as being robust" (cited in Yin, 1994); Furthermore, the data were analysed from the beginning of collection by

coding which helped to decide what further material was needed until saturation was reached, using theoretical sampling. Last but not least, under variation strategy (Moustakas, 1994), the study was done under different circumstances, where finding similarities within variation could lead to generalisation (Mayring, 2007).

In this research, an in-depth study was carried out and detailed observations made, in order to present an accurate story. Together, with three cases that have been reviewed and compared, it can help to come to a theoretical generalisation of my findings; combining it with future quantitative research, we can come to a thorough study which can be both generalised theoretically and statistically.

3.3. Data Collection

To carry out a qualitative research, scholars recommend several data collection methods consist of participant observation, interview, focus group (Flick, 2002; Yin, 2003), documents, and visual data (Flick, 2002; Yin, 2003). The data collection method should be aligned with the selected research method. This study focuses on interviews and observational methods, in line with more sociologically oriented scholars, such as Wu (2008), allowing for more in-depth analysis. Wu (2008) has broken new ground in studying knowledge in supply chain. He showed his interests in using in-depth interview for analysing supply chain related factors (see Section 2.4). Although this thesis was planned to be completed in four years, the chronological dimension was touched on through its cross-sectional approach, selecting companies in different countries to study supply chains. Through interviews, the longitudinal aspect of this research was teased out by asking the respondent(s) about their roles in order to recognize managerial and employees' involvements in knowledge creation. This follows on from previous research (e.g. Wu, 2008) that suggests by reporting experiences, individuals can provide rich data about their functioning circumstances, their roles within these circumstances, and how to interrelate them. Here, Silverman (1985) observes "the interview data display neither cultural realities nor accurate, but simple real".

There are different kinds of interviews and the most common forms are structured interview, unstructured interview and semi-structured interview. The structured interview is an interview type with predefined questions that has to be raised in each interview. While in the structured interview, the interviewer should use the same interview order in every interview and carry out the interviews closely, the

same way in this research in each interview the questions should be different according to their specific supply chain practices and the interviewees' positions. Therefore, there may be insignificant changes in a number of the questions and this requires a degree of flexibility in designing the questions or the sequences of the questions.

In contrast, the unstructured interview is founded on open discussions about a specific subject which is usually the researcher's favourite when there is no certainty about the details. By conducting general discussion, the researcher tries to learn from general aspects (Hair *et al.*, 2007). There are more broad questions to be asked to find out the particulars from the responses. Since there are specific areas with specific questions for this research that are required to be answered, the broad questions cannot fulfil the goal of this study.

Thus, the semi-structured interview that is defined as “having an overall structure and direction, but allow a lot of flexibility to include unstructured questioning” (Hair *et al.*, 2003) is chosen. This method fits the researcher to raise questions related to an answer that is given by the interviewee. This method is fitting for this research since it provides the researcher with room to be able to modify some of the questions based on each interview requirement so that, for instance, regarding customer knowledge and supplier knowledge questions can be probed distinctively.

Beside the semi-structured interview, based on the Ghauri and Gronhaug (2002), the observation is employed to allow learning and analytical interpretation for paying more attention to what people do, i.e. to study their work rather than studying what they articulate. This is in line with Nonaka *et al.*'s (2000) discussion that knowledge is dynamic and must be studied dependent upon time and space, as well as Barley and Kunda's (2001) argument that people are not able to make conversation about the particular tasks they do outside of the framework of truly performing it. It conforms to Styhre's (2003) notes who urges for more in-depth research on knowledge management concentrating on the individuals. In keeping with Barley and Kunda (2001), the importance of participant observation of how people deal with their knowledge in practice, this study is built to deal with what people do, what they know, and how they put it into practice.

3.4. Sample Selection

The probability of having accuracy-illusion increases when a researcher

refrains from doing comparisons. While the basis of variation is undeniable, relying on a single case study brings about an unrealistic uncompetitive environment. For sample selection, three case studies from the fashion apparel industry are considered. The rationale of studying different case studies is to provide a general overview of their understanding of knowledge creation process and the influence of that on their supply chains comparatively. Although the nature of their business plans and their policies equally affect the way in which their organizations use knowledge, they almost differ in terms of lead-time, product life cycles and many other supply chain aspects which influence their activities. This study concentrates on the similarities which exist in the fashion industry, and considers the differences in order to construct arguments that can address the research question.

The findings of the data collection which resulted from the time I spent in a variety of the departments, a selection of stores and distribution centres are meant to interpret the conducted interviews with managers of different departments as well as senior team members in order to cover a huge number of perspectives. However, a selection of departments and managers were under more observation due to their dependency on the research aims and objectives. In addition, informal meetings, review of applicable systems, company documentations, official statistics and self-observations helped me to fulfil what interviews lack (Schultze, 2000). This has made additional details to triangulate some of the statements and views expressed by interviewees (Ghauri and Grønhaug, 2010).

Regarding access to the companies, to avoid disappointment, a wide range of fashion firms were informed of the main aim of this research via email or telephone during the pilot study. In total, with various possible sources of help, I arranged meetings with 10 companies including agents from Adidas, Reebok, Mel & Moj, Geox, Diesel, Benetton, Sisley, Adolfo Dominguez, Marina Rinaldi and Debenhams. However, in a meeting with my supervisors, Debenhams, the British fashion department store, the Italian Benetton, and the Spanish Adolfo Dominguez were selected as they seemed to be the most cooperative links. Taking into account the theoretical sampling in case study range, I also considered that all three companies should have a global view and be interested in knowledge management. However, I also wanted different companies in terms of degree of globalization, knowledge creation strategies, supply chain development and marketing plans. Subsequently, as soon as the initial agreements were made, the agents of these companies approved to

allocate free time.

The first round of negotiation with Debenhams was organized in 2009/10. After reaching the agreement with the Head of International Division, the administrator of the division made a contact through the Department of Management at King's College London to invite me to meet the divisional team members. The first meeting was arranged for November 2010. Based on the first comprehensive meeting, a schedule for my visits was set and the international administrator of division emailed other departmental managers to arrange time for my interviews. The first set of interviews was conducted in February 2011. That continued for seven months when I met the managers at the Strategy Department in August 2011.

Data collection also began in Benetton and Adolfo Dominguez, starting late 2010, after I was introduced to a regional manager who introduced me to the principals of the companies. Subsequently, interviews were conducted with appropriate department managers and team members, including supply chain, procurement and logistics, sales, purchasing, operational and R&D, who had significant roles in supply chain planning and developing.

Accordingly, I was allowed to attend a series of daily conversations by the requested interviewees who sometimes invited me to stay with them after the working hours to discuss issues in an informal setting. Considering the period of data collection was wide, in the meantime, I began to process data analysis to assure the outcome of interviews were decent. In case, when the additional information was required, I still had a chance to pursue them in my next meetings. In some cases when an interviewee was unable to meet, on most occasions they were kind enough to respond to me via email, if not by phone.

When the participant observation was made either before or after the interviews, I had the background knowledge that facilitated me to compare the ideas and discussions, which certainly helped to interpret the situation. In order to establish reliability, 'pattern-matching' (Yin, 1994) was applied where empirical patterns compared with those of self-built theories, which were established based on the literature.

In almost every case, the routine was to interview managers before their team members to facilitate my general understanding of work environment. Then, while similar questions were expressed for other members, the attempt was to encourage them for producing their own unique ideas so as to feed deeper analysis. The aim of

conducting these interviews with team members is to identify at which stage of the supply chain the networking leads more employment involvement, at what stage knowledge creation is mostly practiced, and how they perceive the SECI process and tacit and explicit knowledge distinctly.

Between November 2010 and September 2011, all of personal interviews were conducted, with their breakdown shown in table 7. The end point to the number of interviews was selected when data saturation occurred. This is where the researcher is no longer hearing new information and so no more data needed to be collected. In addition, beside the ease of access to potential interviewees, the number of interviews in each company is the reflection of the density of managerial roles.

The interview questions were prepared to act in response to the research question in general and the objective of the research in details. The questions were also designed to enable the interviewees to easily respond with answers. These questions are on the basis of the literature review and they allow the interviewees to illustrate the existing contents within the questions' boundaries. The questions have three dimensions; general and organisational details, intra-organisational and inter-organisational points of view. Considering the method of knowledge creation to produce tacit/explicit knowledge, as the interviewed organisations had at least one customer and one supplier, one perspective of the questions is on organisation's knowledge from its customers and their customers' knowledge from them. The other perspective is an organisation's knowledge from its supplier's and their suppliers' knowledge from them so supply chain knowledge creation to be learned. Before each interview began, a very short explanation was provided to the interviewees to clear up any uncertainties. Likewise, the questions were provided to clarify the likelihood of common concerns regarding knowledge resources between each supply chain members.

During recruitment, interviewees were provided with a research proposal indicating the aim of the study as well as the information sheet regarding the ethical considerations. Each interview was held in a private room to ensure no interruptions. Interview durations ranged between 30 minutes to over 180 minutes. The interviews were recorded with the permission of the interviewees, and they were guaranteed confidentiality. While the interviews were conducted, the qualitative research methodology was performed for supply chain groups to test the relationships of the interview questions in the interviews. Finally, the interviewees were allowed to read

the transcripts of their records to provide clarification while the trustworthiness of the research was guaranteed. Ghauri and Gronhaug (2010) note this statement and discuss this approach as the aspiration of generating new questions and collecting new data.

Table 7. Data collection frame

Name of Company	Number of interviews with core participants	<i>Total duration (hrs.)</i>
Benetton	22	34.83
Debenhams	19	25.33
Adolfo Dominguez	15	19

In order to acquire common sense, a significant amount of time was spent attending fashion events, such as fashion fairs, catwalks, London Fashion Weeks and fashion seminars in the London College of Fashion at the University of Arts London. This engagement in the field also helped to learn about the background and situation of the world fashion to recognize significant data. Likewise, it helped to recognize the likelihood of critically evaluating new styles in a space where professionals organize stylistic regeneration through peer review processes in which knowledge management is understood and rewarded publically.

3.5. The Description of Cases

3.5.1. Slow with the Flow of Globalization: The Heritage of Fashion Industry in the UK

Fashion industry is one of the liveliest sectors in the UK and the UK fashion retail sector attracts global audiences for its charm created across the centuries. Some of the most successful talented fashion designers, from Paul Smith, Vivienne Westwood, Alexander McQueen, and chains such as Mulberry and Burberry to new generation designers such as Peter Pilotte, Christopher Kane and Mark Fast are discovered from London Fashion Week (LFW), catwalk shows, fashion showcases, fashion exhibition centres and museums (Goodrum, 2005). Since the industry has changed significantly in the past decades, it is not only about the importance of design capabilities in the UK but also the competency of comprehensive network of materials, textile fabrication, manufacturing, warehousing, wholesaling, marketing and retailing of fashion products with supply chain functions. In this regard, Scotland is described for the manufacturing of knitwear, the Northwest by industrial textiles, Northampton for footwear production and Manchester for fashion education (British

Fashion Council, 2010). However, pertaining to the fashion industry in the UK is the non-existence of textile production factories, which, over time, has been challenging to retailing the fashion products. This is while in the last 30 years British Fashion industry has been hit hard by the absence of investments, and merchants who are after sale of crowd-pleasing products, would definitely be obliged to consider outsourcing in order to rectify the scarcity of production hardware in the time of manufacturing recession. Inevitably, due to the deficiency of hardware facilities, the skilled workforce, experienced with trading methods and technological expertise will escape from the borders.

Apart from companies such as Aquascutum, Burberry, Mulberry and Barker which stay in the UK, sourcing has been shifted from UK over the last years and companies have sought to source products from emerging countries in Eastern Europe, South America, South Asia and Far East (Cooper *et al.*, 2005). Cooper *et al.* (2005) mention that British textile industry began to be outsourced later than many other European courtiers and describes that in the 70s, almost all sectors of textile and clothing supply were located entirely in the UK.

According to British Fashion Council (2010), in 2009, the UK fashion industry contributes in output to build UK economy with nearly £21 billion directly and another £16 billion indirectly by means of other related industries. Excluding retail distribution, which contributes to this number by 22.5%, it is estimated that marketing made the most by £241 million, £205 million by fashion media and nearly £16 million by fashion education. In comparison, the summary of economic contribution shows fashion contribution was much more than automobile manufacturing (£10 billion) or chemical manufacturing (£10.5 billion) and only behind tourism industry (£40 billion) (ABI data, 2008). From this amount, Debenhams and other similar department stores offer large number of multi-national brands, which attract market share of 23%. This amount is close to 26%, the share of specialty stores, like Gap, Next, French Connection and Jaegar, those which offer a limited range of products. High street fashion brands such as New Look, River Island and Primark with a large number of products account for 15% share of market. Off-price retailers, such as TK Max offer luxury brand names up to 60% less than their original retail price but with partial assortments of goods account for 8%. Supermarkets such as Tesco, Asda and Sainsbury's have 17% of shares and finally

11% of remaining sales is shared between online retailers, factory outlets or mail order companies. (Cooper *et al.*, 2005).

Debenhams: The Old Local Department Store

Debenhams was established in 1778 as a single store in London. Now, Debenhams has 167 stores in the UK, Republic of Ireland and Denmark and 60 international franchise stores in 23 countries (Debenhams Annual Report and Accounts, 2010). The Irish one is branded Debenhams and it is assumed as a part of the company while 'Magasin Du Nord', the Danish partner, has been left under the name of Magasin. It is still trading as a separate company to most and a profit number from them goes into Debenhams accounts. Since then, Debenhams has very little interaction with them and all is done in terms of trading with Magasin is where they run mostly a concession model. Therefore, when some of the concessions do not work very well, they are cancelled and Debenhams put in own designers to look like a systematic concession. Also, the Danish Department of Construction supports the brand by fostering public services and the investment on the point of sales (PoS), the merchandising systems, the finance systems and therefore all the personal systems are exclusively managed by Magasin so this study does not cover these information to be related to supply chain analysis.

In particular, to understand the demand side mechanisms of Debenhams supply chain, for interviewees at Debenhams, its average products are positioned as medium in the market classification. Known as a price sensitive department store, in 2010, the revue of company exceeded £2.12 billion (Debenhams Annual Report and Accounts, 2011). Its price entry is same as the company's main competitor, Mark and Spencer's, but due to the presence of some high fashion brands, the average price is higher. Since the product types are the same, House of Fraser and Boots are in competition with Debenhams for providing a better service and healthier atmosphere. Meantime, Debenhams does not compete with likes of Primark's and supermarkets, which follow different supply chain strategies.

In order to study the supply of merchandises and their consumptions more specifically, the classifications of products are important here. In broad-spectrum, Debenhams has own brand products, external brands and concessions. Nowadays, 70% of the products is own brands and designed by in-house designers at Debenhams. The concessions are only influenced in the store but Debenhams does not design

products for them. External branded products are mainly in Home Division. Examples of external brands are Le creuset, Prestige and obviously cosmetics are all external. But in Women's wear 95% are in-house brands, which is the Debenhams' own choice, own fabrication, own structure but manufacturing is entirely outsourced to 10 major supplier contractors. External brands at Debenhams show off some of the favourite names in the British fashion industry. The very first designer collaboration began in 1993 with Philip Treacy and BDL by Ben De Lisi and in 1996, J by Jasper Conran launched the first major collection for women. Apart from them, others are John Rocha, Betty Jackson Black, Butterfly by Matthew Williamson, H! by Henry Holland, Star By Julien Macdonald, Frost French, Erickson Beamon, Eric Van Peterson, Janet Reger, Pip Hackett, Melissa Odabash, Ted Baker, St George by Duffer and Jeff Banks. Each designer works throughout the year with design managers, merchandisers and buyers from development of the brand, labelling, and packaging through to the manufactured article in store (Debenhams, 2011).

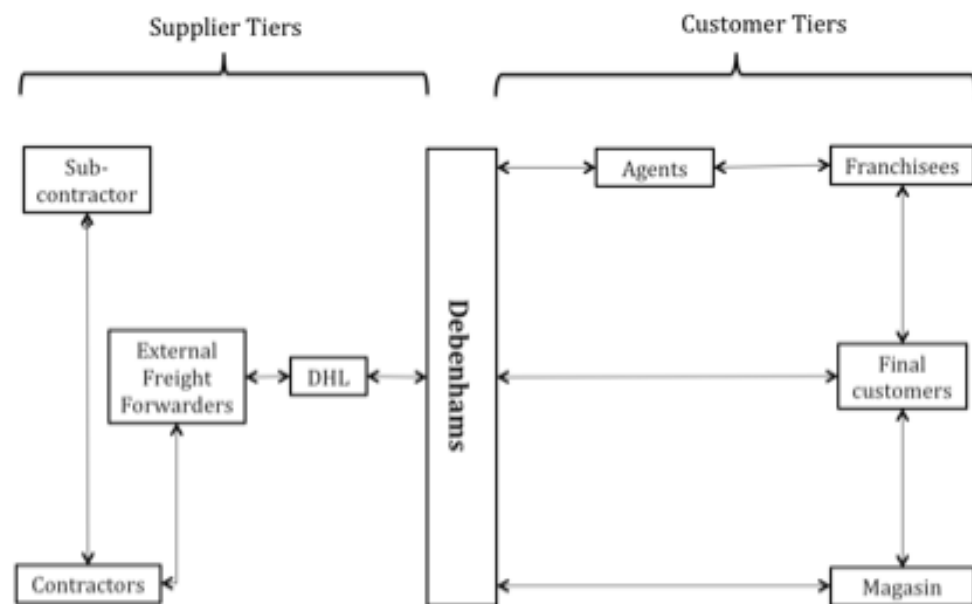


Figure 8. Debenhams' position in its supply chain network

3.5.2. Scattered by Outsourcing but still Fashionably Alive: The Italian Fashion Production

Because of the acknowledged role that the Italian fashion plays in the 'ready to wear' market globally; it is also fitting in the context of this research. According to the Italian Textile and Fashion Industry Federation, in 2008, the Italian fashion industry contributes to the European Union fashion system by £45 billion revenues. As Dunford (2006) studies, value-added in the Italian textile and fashion industry

continued to amplify from 1970 to 2000, in contrast to the sector's competitors in the UK where manufacturing lagged sharply. While this turnover accounts for 27% of the regional turnover from sales, the worldwide outsourcing strategies have not impacted the textile manufacturing and the Italian manufacturing firms still account for over 8% of the regional value largely as a result of their high-skills, high-quality and high-end strategies (SMI-ATI, 2009).

Nowadays, the inevitable progression toward globalization causes the wellness of long-establish Italian fashion enters an era where advertising and promotion overtake the rich quality. Competition from low wage suppliers threatens not only low-end producers, but taken into higher-value added niche markets that Italian firms had long dominated previously. Nevertheless, the Italian fashion still sounds of a wealthy cultural inheritance that mostly reminding the luxurious period of Italian Renaissance (Kennedy, 1991). While for many practitioners, the development of the industry in segmented phases is not researchable, though Italian scholars classify the evolution of fashion in four chronological steps from Pre-1950s to post-1990. In the primary centuries, cities such as Milan, Florence, Tuscany and Venice were leading the artistic design for fashion goods specially the jewelry, which was at its peak in popularity. By the beginning of WW2 the industry faced with lack of prosperity but following the war, the industrial production systems recognized as the dominant strategy to produce fashion products in the textile plants. In the years leading to the beginning of 80s, the Italian fashion characterizes massively changed as a new social change emerges in the Western European territory. While Italy had been a country in charge of democratization of fashion, the "Made in Italy" appeared to be distinctive in 80's (Vercelloni, 1995 and Steele, 2003).

Nevertheless, the attractiveness of Italy as the country of original fashion ideas attributed to the work of designers such as Armani, Versace and Bottega Venega that comprehended the necessity of global overconsumption by thriving high-end mass productions in 90's (Celant *et al.*, 2000). By the mid 1990s, most of Italian firms began to fear low-wage production, and decided to invest in a joint venture in Asia. According to these changes in manufacturing and product development approaches in Italy in contrast to the France, the main competitor, the focus was on lower-end raw materials. Following that, toward the end of the 20th century, to confront with financial revisions, a huge number of brand names including Benetton sourced out the designers sketching models for franchisees to experience a new age business (Steele,

2003).

Benetton: The Recklessness of Market Expansion

Today Benetton is one the largest fashion manufacturer in the Europe with a strong character made by its creative colourful designs brands with reference to the fashion anthropologist. Its supply chain model has been based on the external production, indirect sales and retailing networks (Figure 9). United Colour of Benetton (UCB) is the flagship chain store of the Benetton Group owned by the Benetton family, who also owns brands such as Undercolours of Benetton, Sisley and Playlife. In 1965 Benetton was founded in a small town called Ponzano Veneto, which is near Treviso in northern Italy. Although the very first Benetton shop was opened in Belluno in 1966 but in less than a decade Italy observed a booming expansion of the brand throughout the country. After becoming dominant brand with almost 500 stores in the early 70s, the exports became significant with store opening in United Kingdom, France, Germany, Netherlands and Belgium. However, this strategy led the company had reached an edge in scale, and an organizational reconfiguration was required to avoid downsizing. Subsequently, the family assumed franchising system as a strategy to expand the business could be revolutionary to enter new markets. In the 1980's and due to the international expansion sales extended to all over Europe, the USA and South East Asia. To be in the safe side, for instance in the U.S, Benetton offered license to local producers and then they were given a chance to work as joint ventures (Benetton, 2010).

Retailing has always been the main strategy in the company's profile. In the 1984, Bruno Sutter and Oliviero Toscani, two famous photographers, brought up 'All the colors of the world' to promote the idea of a peaceful world. In spite of great achievements obtained from advertising campaigns, in some cases, Benetton image was suffered as well. One great example is the 'shock' campaigns displeased for the subject of some photos (e.g. nun and priest kiss). In early 1990s another achievement was the success of the brand for Formula 1 in 1994 and 1995, which the team won the world championship. In the timeline of the company, in 1992, Luciano Benetton, the oldest brother of the family, was elected to Parliament and helped his company by putting it in the limelight again (Benetton, 2010).

Since late 90's Benetton sales decreased in many regions due to a tight supply chain competition with its international rivals such as American Gap, Swedish H&M

and Spanish Zara. The decrease in sales attacked the revenue in Europe where in 2006, 48% of revenue was obtained in Italy, 36% in the rest of Europe. However, the fastest growing markets like China and India have given 12% of revenue from the Asia and North and South America contributed 4% of sales revenue. Nowadays, the company operates in 120 countries with more than 6500 stores and the production capability of up to 130 million garments a year (Benetton, 2012). The garments are classified in three collections: ‘Trent’, a collection for more insightful buyers with time to market between one to four months. The second collection called ‘Just in time’ for sensitive customers and the third is ‘Continuative items’ that use standardized materials for production, which can be supplies in seven days if made in Italy. In terms of market positioning, the brand is classified as medium to high for upper-middle market.

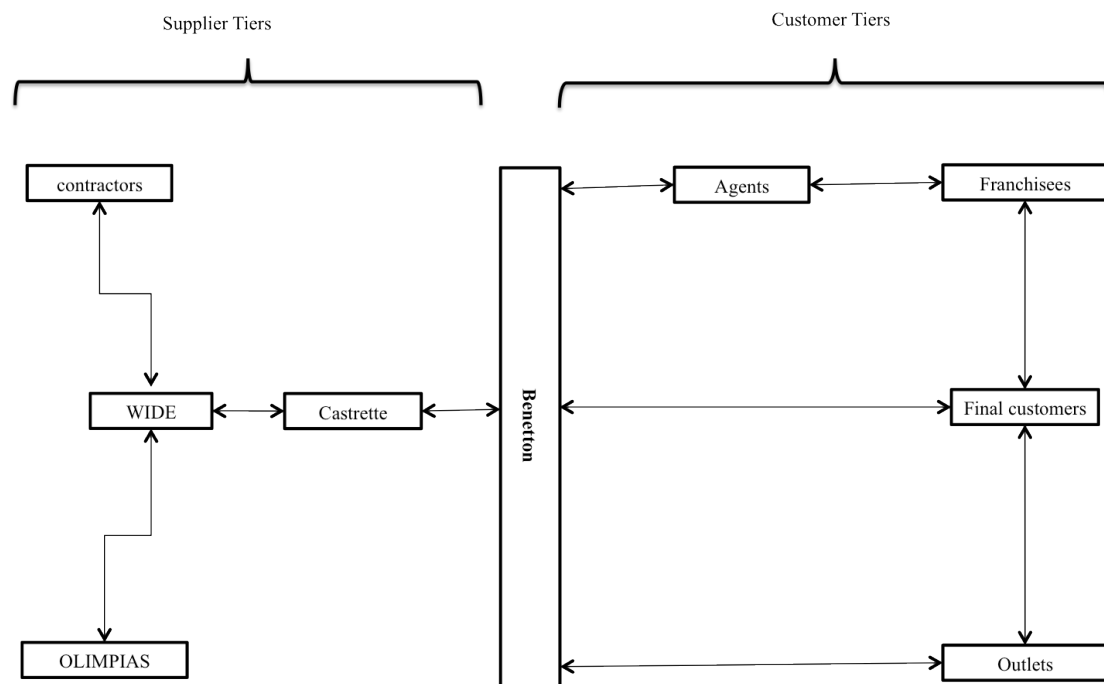


Figure 09. Benetton's position in the supply chain network

3.5.3. New Insights into the Concept of Fashion: Value of the Spanish Fashion Industry

Until mid 1980s when Spain entered the EEC, its fashion industry had been characterized by a high degree of protectionism⁸. For that reason, the fashion industry

⁸ The protectionism system refers to high custom duties in addition to quotas for specific garments and countries. At the same time, extra protection was defined through some non-tariff barrier.

in Spain has been booming recently thank to the level of international growth into a chain of stores worldwide. Likewise, the presence of prestigious brands on catwalks in the Mercedes Benz fashion week Madrid, 080-showcase Barcelona and the Valencia fashion week clearly enhances the creditability of the industry. Among the most popular brands, Pronovias, Paco Rabanne, Ana Gonzalez and Manolo Blahnik⁹ are those, which make the most of advertising potentials to attract high-end market. Their outshining performance in comparison with the British and the Italian competitors owe to the local modelling agencies that introduce appreciated names in the industry likes of Veronica Blume, Laura Ponte and Eugenia Silva. In mass-markets brands like Mango, Pull & Bear, Loewe and the clothing chain Cortefiel are the dominant power of the Spanish high street while selling strong internationally (Calvo, 2006; Austrade, 2007).

Nevertheless, from early 1960's when Spain had a dictatorial government and the fashion sector experienced unhealthy atmosphere infrequent demands for the next twenty years up to now, the country never seen a brand like Zara. While, in 1985 garment production was concentrated in Catalonia, Valencia and Madrid, only SMEs with low level of technology and productivity were the dominant players of the market. Amancio Ortega in mid 1980s established the Inditex Group and revolutionized the Spanish fashion industry with the fast-fashion model. This new wave of fashion management brought other brands like Adolfo Dominguez¹⁰ and Roberto Verino into the success by large investment in technology and mechanization to produce clothing in 1990's (Bozdemir *et al.*, 2009). In 2010, the Spanish clothing sector contributes in national economy with turnover of 1.350 billion PESETAS, which is still less than the British and Italian figures, but it keeps Spain among the top five European fashion markets. While the turnover has risen significantly, according to the latest figures, 6% of people who employed by industrial companies work in the clothing sector (Cityc, 2012).

Adolfo Dominguez: Fashion Forward

AD is a well-known brand with great prestige in the Spanish fashion market

⁹ Manolo Blahnik turned to a popular brand between up town professional women from the time the American sop opera "Sex and the City" character Carrie Bradshaw named the brand as her favourite.

¹⁰ To facilitate reading, Adolfo Dominguez (lower case) refers to the designer name, and AD to the company.

operating locally in comparison with many other fashion companies that are growing process of internationalization. If we accept the fact that the boundaries between fast and fine fashion that are hiding gradually, competition between AD with those brands is yet to become higher. To maximize profit in this competitive market, AD is about to improve the differentiation of supply and to face an ever-increasing competition in price factor.

It is a company that was established in 1973 when Adolfo Dominguez finished his Art studies in France. After graduation, he went back to his origin in Ourense to start working in his family's store with a mission:

“...A life, a brand, a designer, a style, a company, a feeling, a way of living, a value, a journey, an aroma, a human being, a passion, a language, a verse...” (Adolfo Dominguez, 2010)

The company aims to offer products for customers who want to dress stylishly and have clear conscience at same time (e.g. the accessories are made by 100% sustainable material). The leather materials are not made from animals while they are also not made from fur and feather. Instead, suppliers use synthetic materials, which require high technological advancement though with higher costs.

In 1977, AD Men, Women and Basic collections were born and the brand influenced the way Spanish high society dressed up. Between 1986-91, the company was really booming in Paris Salle Wagram fashion shows and at the Casa de Campo fashion shows in Madrid (Adolfo Dominguez, 2010) where Adolfo Dominguez introduced his new line for fragrance production. Since the strategy of the company changed from wholesaling to retailing in 1992, Adolfo Dominguez became responsible of designing, product manufacturing and distribution at his sales points. In 1997, he received the ‘Galician of the year’ award and ‘The Golden Needle’ for his works and later the company was accepted at Madrid Stock Exchange in the same year.

Since then, the company has expanded its operational capacity by launching the U Line for young generation in 2000, Azahar perfume between 2001-03, AD +, AD Kids and Agua de Sandalo and Noche de Rosas fragrances in 2003, watches, jewellery and decoration Mi Casa, U Black fragrance in 2005. In 2006, AD has been introduced as the winner of Lifetime Achievement in Fashion in The Miami Fashion

Week (Adolfo Dominguez, 2011). Along with Internalization strategy of fashion, he has been continually expanding his territory in Latin America with the opening of new stores in Chile, Peru, Argentina, Mexico, and Panama as well as reinforcing his stores in the Middle East with opening of the second store in Kuwait and first stores in UAE and Iran between 2008-09. By the end of 2010, AD had about 700 point of sales internationally, 450 of which are located in Spain and the extensive online shopping opportunity for global markets. In the same year, the company's sales reached to more than £146 million in 27 countries (Adolfo Dominguez, 2010).

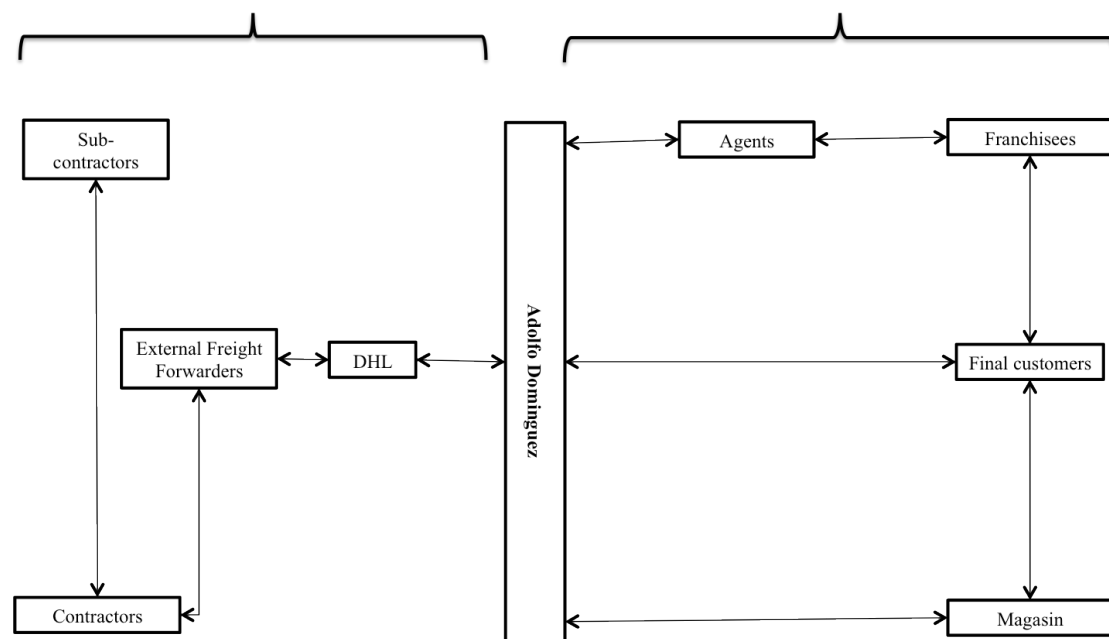


Figure 10.AD's position in its supply chain network

3.6. Data Analysis

In this section, the analytical orientation, which is employed to respond to the research question, will be explicated. The analytical aim of the research is to make sense of the entire context and the relationship between people, the organization and technology (Myers and Avison, 2002). Consequently, the fundamental philosophy states an iterative process of data collection analysis (Walsham, 2002), which are customized to approach a coherent interpretation (Glaser and Strauss, 1967, cited in Kelliher, 2005).

Unlike statistical methods, there is less agreement on the likelihood that textual data can be evaluated. In order to analyse textual data, data interpretation and explanation are more important than pure mathematics that is emphasized in statistical

investigation. Furthermore, in qualitative studies, it is much more complicated to split the construction of data from its analysis (Thomas, 2004). According to Ghauri (2004), the phases of any type of qualitative data analysis begin with coding and the categorization of the text. Then, trends are identified to determine findings. Finally, the data is integrated into an explanatory framework. These stages, as it is followed in the research, are summarized in table 8.

Table 8. Case study data analysis (Ghauri, 2004)

Stage	Purpose
Chronologies	Narratives of events that took place, organised by date
Coding	Identifying anchors that allow the key points of the data to be gathered
Clustering	Categorizing cases according to common characteristics
Matrices	Explaining the interrelationship between identified factors
Decision tree modelling	Grounding a description of real decisions and actions coherently by using cases
Pattern matching	Comparison between a predicted and an empirically based pattern

In this method, since qualitative studies make it easier for building theories, coding requires special attention, and a balance between creativity and persistence is essential in the stage of decision tree modelling. Yet, in this research, the observational data were coded systematically using a coding scheme developed in a series of forms wherein theoretical codes were supplemented by those received from analysis of the transcripts. Initially, a list of codes was planned and approved before the coding process began, including entries from the conceptual model, questions and theoretical discussions. Then, these codes were combined with the codes emerging from data. Thus, the coding scheme covers both the factors involved in the pre-built model and empirically driven data.

In order to utilize the analysis of data collection, there are various software programmes available that can push the researcher in sorting and coding the data. In

this study, for some unobtrusive data, content analysis via NVivo was engaged in qualitative data to analyse until the transcribed information is made comparable. Nevertheless, NVivo may make qualitative data misses, by its nature, and it is the researcher's decision to decide to what extent structuring is satisfactory (Ghauri, 2004). To prevent the analysis of NVivo from becoming laborious, validation was mainly strengthened by triangulation whereby multiple data and theoretical approaches were employed to research similar phenomenon manually (Silverman, 2005).

According to Berg (2001), seven major factors can be counted in content analysis: "words or terms, themes, characters, paragraphs, items, concepts and semantics". In addition, Ghauri (2004, 2008) introduces a flow chart that highlights how analysis should be processed. Based on this model, in first stages the codification is undertaken and then it is utilized for browsing nodes in the developing stage in which key themes assist to display new relationships.

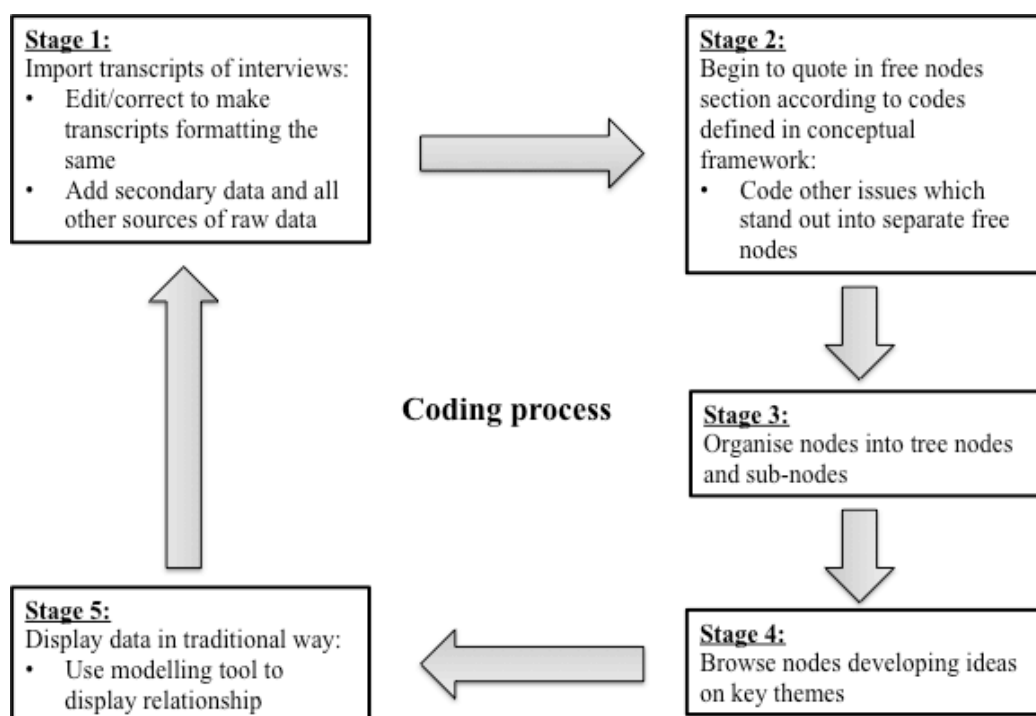


Figure 11. Coding process (Ghauri and Firth, 2009)

Generally, analyses of the interviews follow procedure of tree nodes. Each interview was transcribed verbatim from the audio recording. Each transcript was followed many times and all the speeches that looked to be information-rich were highlighted. In addition, statements that seemed to have similar themes were embedded together under a name in free nodes as an output of the created tree nodes.

In this study, the free nodes were classified into three categories. The first free node includes socialization, externalization, combination and internalization. The second node includes sources of complexity in six stages of design, manufacturing, logistics, distribution and retailing. The last free node is made up of social and technological resources. An iterative process was then used to further improve contents in these nodes until the agreement upon a suitable set of categories that satisfactorily account for the selection of statements was achieved (Anderson and Felsenfeld, 2003).

3.7 Conclusion

The purpose of this chapter has been to present the methods of data collection used for this piece of work. It has discussed that given the overall concern of this thesis, to identify how companies construct and manage knowledge creation within supply chain relationships and how within this process complexities are tackled, interview and observation methods of data collection are employed in order to get valuable first-hand data to fulfil the gap in the literature given the lack of previous research in this particular research area. It has then been through the specific methods of data collection before offering an argument for the analytical method used in this thesis that suggested driving coding enables the data to be categorised for analysis. Once categorised, models could be developed step by step through systematic study expanding the concerns that are followed in the next three chapters.

4. Knowledge Creation Awareness at Intra-Organizational Level

So far, I have discussed the context for this research, providing a critical analysis of the current arguments about knowledge creation and the need for thorough consideration of global complexities in managing supply chains, particularly in terms of the use of knowledge resources. I endeavour to investigate the likely effectiveness of knowledge on these supply chain complexities in different key steps through which the fashion supply chain, knowledge creation and management interrelate.

To analyse cases based on the model, the core issues here are the process of knowledge creation from individuals at the intra-organizational level to the supply chain level with the emphasis on the interaction of social and technological effects, as introduced in the conceptual model, revolving around SECI in an analytical manner to fulfil the research questions. In chapter three, a methodology has been provided in order to construct a rich qualitative exploration towards the empirical verification.

Each of the supply chain tiers possess distinct characteristics, of which, the intra-organizational is discussed in the current chapter. Downstream chain is reviewed in Chapter five, and finally upstream chain in Chapter six. Lastly, in Chapter seven, I turn to discuss the cases to reveal how different reactions to complexities shape the knowledge creation in supply chain operations.

More specifically in Chapter four a classification of approaches to intra-organizational supply chain knowledge creation is developed to compare the management roles in different companies, in encouraging employees to commit to productive social interactions based on a standard computerized process with sustainable outcomes. The importance of intra-organizational knowledge creation process for this thesis is based on the influence of managers and their teams in headquarters (HQ) for decisions. HQ is where upstream and downstream information flows meet, showing its key role in managing knowledge for identifying resources. Although HQ represents only one tier in the supply chain, the importance of its role must not be overlooked. The perception an organisation has of itself is as a “brand” and not just a chain of global collaboration originating in the HQ. Therefore, in order to express the ideas of a knowledge creation process based on global supply chain policies, the key role of HQ must be emphasised. Thus, it is important to realize how

knowledge is recognized in inner layer of organizations, as it assists to allocate resources efficiently (Baum et al., 2005).

While this chapter is set out chronologically in terms of the implementation of the process case by case, the comparisons make clear that managers in the real world typically operate without an explicit theory of knowledge creation. In fact, based on the organizational structure in figure 12, the knowledge creation process performed is extremely subjective, following the model at some points and deviation substantially from it at others. What knowledge resources there are for a knowledge creator is to be understood through strategic positioning in the work, which in turn depends on an understanding of individuals about knowledge creation or the capability of the organization to sustain the conversion dynamics.

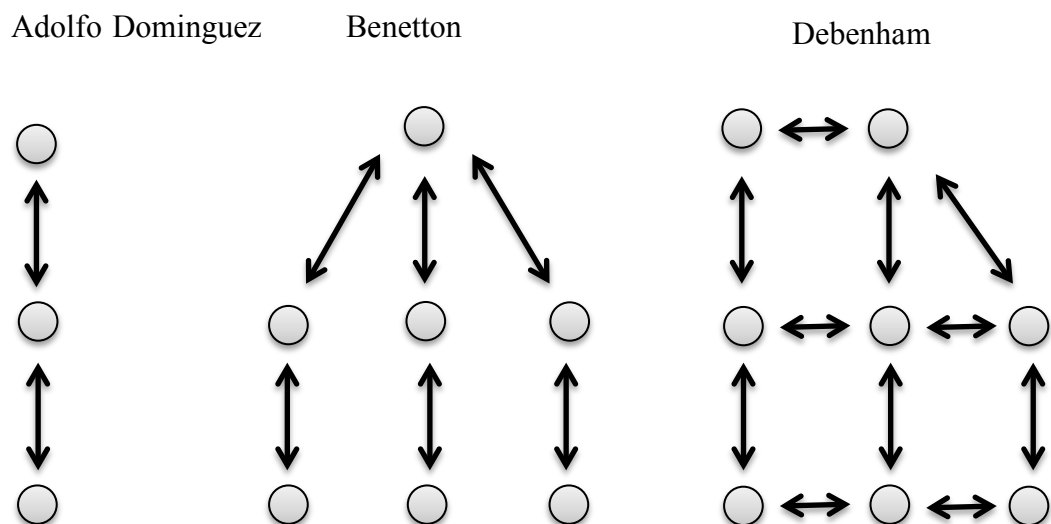


Figure 12. The comparison of intra-organizational structures

Analysis of the data at this level also makes it clear that the most significant limitations in processing intra-organizational knowledge can also be present at the inter-organizational level of the supply chain, which will be the focus of the next two chapters. In other words, the outcome of the process would be partial when either the employees are discouraged from participating or managerial control disconnects the stream of knowledge that will be used in the supply chain.

Although in some occasions it was difficult to recognize the extent of form of managerial support for employing particular strategies within teams, attending face-to-face meetings with them allowed me to differentiate between their attitudes towards managing knowledge. In general, the awareness of interviewees about

knowledge creation in the theoretical terms was above my personal expectations, in most cases. However, the need for a large revolution in their individual relationships or a modification of their technological resources was present. This posed a smaller threat for an organisation compared to a supply chain, mainly due to the size, since it is easier to manage the smaller entity in traditional ways should a relationship or a resource fails.

The results of inter-organizational analysis will be shown in Chapter five and Chapter six.

4.1. The Middle-Up-Down Management: The Mighty Middle Managers at Debenhams

As suggested by Nonaka and Takeuchi (1995), most of what happen in intra-organizational relationships is actually related to middle managers' roles. How do middle managers create new concepts through linking tacit knowledge of top management and front-line employees into explicit knowledge to decrease supply chain complexities? Answering this question will allow us to understand some of the values attached to their central role during the process, particularly when financial complexities causes knowledge management to be limited to their experience and paper based files instead of complex electronic warehouses.

Particularly, at Debenhams, decision-making is highly affected by knowledge creation capabilities generated by involvement of these middle managers who consciously arrange the daily tasks to encourage the conversion of knowledge. In spite of the fact that the knowledge creation process varied from department to department, depending on the management characteristics and availability of resources, they act as 'knowledge crew' (Nonaka and Takeuchi, 1995) that actively coordinate employees in one hand and support top management on the other hand. For instance, compared to the accounting department, where employees look stern and serious, within internal design teams, the management is keen on providing an environment where employees can share their ideas freely. A Supply Chain Manager supported this and highlighted his way of working:

"I generally sit down with my guys individually quite often during a week and I sit with them as a group monthly and that has a big feedback in our productivity". [Supply Chain Manager]

The Head of Import and Export, also, concentrated on his direct role as a middle manager in employing knowledge creation techniques at Debenhams. He gave an example of his claim and named one member of his team of 14 who did a trial on handbags to balance standard operating procedure and service level agreement at the planned costs requested by top management sometime before my observations began:

“We buy lots of those from Far East. Leather handbags, they are coming all in different sizes and shapes. What he notices is, when we transport these, we put in them plastic air filled bags. So, to retain the shape and obviously the quality. Now, for £200 handbags you want to do that. For £5 bag would you want it? So, removing the plastic bag and protect it with paper. But make sure that in this way you can load twice as much as into a carton. So, instead of 15 bags now we are getting 30 bags”. [Head of Import and Export]

In this scenario, the middle manager is to resolve a replenishment complexity in organizational relationship between what the CEO hopes and what actually can be done in ‘middle-up-down’ process as introduced by Nonaka and Takeuchi (1995). Likewise, the other managers of this kind operate within lateral exchanges between teams rather than along strict vertical lines of relationships. As a result, both team members and top management are treated as knowledge creators who are able to get involved in the process and create knowledge:

“... we’re collaborating as a group of people who all aware of that there is a goal that need to be achieved for the organization and it’s not anyone of us that’s actually taking the lead... we acknowledge there is an advantage to working collectively on these matters”. [Import and Export Manager]

In contrast to Nonaka’s claim of the existence of a position in companies called ‘knowledge officers’ who “are the senior managers, and the management of the total organizational knowledge-creation process at corporate level...” (Nonaka and Takeuchi, 1995), middle managers may not be aware of their indirect role in pushing the knowledge creation model forward. Here, the conversion of knowledge is neither merely explicit in forms of externalization and internalization (as in top-down) nor tacit in form of socialization (as in bottom-up) but a mix of the two. Human resource

advisors also help middle managers on a monthly basis to find new talents and to constantly guide them to seek people who can succeed current staff in the future. In favour of this notion, it was said by a Supply Chain Manager that:

“Because I am developing them to ensure their knowledge grows and also they have their own assistants and their job is to make sure they are trained as well”. [Supply Chain Manager]

For instance, the smooth involvement of middle managers into the daily store tasks makes them aware of changes in consumer behaviours which, apart from customer satisfaction reports, can be understood by physical involvement into process, thanks to the adoption of the marketing vocabulary by staff at stores.

Despite the focus on the impact of middle managers on the personal developments, middle managers provide a ground for employees to get feedback from other employees as one of the ways in which individuals evaluate their knowledge. Thus, the importance of the meetings, either formal or informal, shape the status of knowledge creation as we shall see further on.

At Debenhams, holding several informal social meetings to do brain storming reunions rather than relying on the intranet systems to prove solutions, for employees who go on celebrating birthdays or simply summer holidays together, corroborates the fact that the importance of social affiliation is well appreciated:

“Once a year, I take the whole office to my house and I throw them into the woods with few clues and pictures, my wife cooks and loads of beers and wines and then I will bring them back”. [Logistics Manager]

This last comment is a frequent catchphrase indicating how much employees are actually involved in sharing experience in informal meetings when a friendlier atmosphere exists. This can be a potential support for Nonaka’s idea on the importance of experience sharing as the fundamental source of converting tacit knowledge in socialization mode, to build trust through a continuous dialogue that may lead to externalization of knowledge (Nonaka, 1991).

In addition, in a more formal approach, although attending face-to-face training courses is a standard service to those employees who recently join any company, in order to construct their sense of success both in line with the norms of the tasks and their own perception of themselves as an employee of a huge company,

Debenhams' freshly recruited employees are expected to attend in socialization one-to-one training sessions to get an extent of job competency before doing any duty. In order to standardize these formal patterns, a human resource service product is also implemented that facilitates the process and it tracks staff task accomplishments so middle managers adopt certain strategies in order to fit these new employees for an appropriate position.

In order to illustrate this by an example, recently someone left the strategy team who had plenty of analytical knowhow. He had been part of the team for approximately four years. Considering Debenhams does a lot of hand-over of the client relationships, it is made certain that all of the works done by team members are shared personally with newly recruited staff before they leave. For instance, in a project for the promotion team in the Marketing Department, the company gets a number of experts to prepare this new employee for producing in response to a particular customer's desires in a one-day demand customization workshop. It was emphasized by one of the middle managers that "it can be of help if it's held right at the beginning of his career". Then, he elaborated on the steps in the workshop. Firstly, the concentration had to be on the introduction of 'the likely consumer behaviour when seeing Kim Kardashian, the reality celebrity who was in London to promote her new fragrance for women'. Secondly, objectives were crucial to him as he highlighted "what number of free fragrance gifts could be the optimum quantity". Thirdly, the scale of the workshop needs to be set depending on the previous steps.

However, to get a sense of their interests in converting tacit to explicit knowledge in externalization mode, when I asked if the length of workshop could negatively impact the productivity of face-to-face meeting while asking the trainee to read the necessary arrangements in his convenient time and submitting his feedback on a piece of paper later could have been more contributing to the knowledge creation process, he assertively defended the positive impact of creating knowledge by means of social interactions more than documentation.

This shows that at Debenhams the very nature of converting someone's tacit knowledge to another person's tacit knowledge is considered a complete cycle, which seems equal to ignore the importance of documentation process for converting tacit to explicit knowledge. But how can that be possible when these messages will not be heard by other staff who might join the company in five years' time? And how to work through virtual teams scattered around the global supply chain for re-creating

knowledge at inter-organizational level (Garavelli, *et al.*, 2002)? When I questioned for more features of this logic, he replied that, an employee requires time to provide briefs to recall his tacit knowledge while materializing knowledge (i.e. explicit knowledge) could prevent his productive involvement. Although this assumption is widespread between many scholars where the emphasis of knowledge management is on individuals (socialization) and practices (internalization) (Argote and Ingram, 2000), the creation of knowledge without materializing it lacks objective (Nonaka *et al.*, 2000).

The fact that materializing knowledge is associated with explicit knowledge, it leaves employees to transfer knowledge in their own way of doing it. It means that the institutional arrangement of the knowledge creation process continues to leave organization at the bottom of the knowledge hierarchical pile. Therefore, SECI is unwittingly weakened through this discourse. For instance, among the teams, the members contact anyone discussing about the source and applicability of knowledge before being able to pick up the work. An example was seen at the time I spent at Debenhams when a new employee joined the carrier team from Harrods, a competing department store. The new employee possessed necessary knowledge of doing his new tasks, including carrier reporting, service improvements and carrier marketing knowledge, as well as valuable working experience, which are significant in parcel carriage companies. The company also encouraged him to bring his previous way of working with logistics partners to Debenhams. Even so, when he arrived, models and concepts in the format of series of induction sessions plus the specific team notes were given by his middle manager to update his knowledge for the new position. He described his first days of work:

“Debenhams has induction to teach you the basic admin tasks and know-how you need to do. Also, I have a specific induction written down for me, which means I spent time with each divisional manager to go through all of the processes we are having internally”. [Carrier Manager]

This strategy supports him to get up to speed and understand the relationships before communicating within the internal boundaries of the company so that he could be trusted. Otherwise, self-declaration of an experienced individual in managing carriers is effectively an empty claim without social acknowledgement of that inherent identity which comes from acceptance by other professionals within his team. In

consequence the importance of knowledge management by training is usually found in the form of a professional employee who suggested the significance of learning process as a way of infiltrating into the knowledge creation cycle.

Another example of how ignoring the internalization mode could negatively affect the process was the overlapping tasks. Sitting in the office behind their partitions and working on their tasks allowed me to hear them chatting and walking corner to corner, communicate inter-departmentally. The atmosphere was peaceful and friendly in most of times. When I asked a manager of Import and Export Department for more details of cross-departmental tasks and projects in his area, he tried to distinguish the interrelated tasks by arguing:

“you may find in some companies supply chain and logistics is the same. For us its more like we are import logistics and they are more responsible for supplier bases. They deal with maintaining with supplier manual ensuring about ethical policies and QA. However, we do collaborate in many cases to make our departmental decisions secured”. [Import and Export Manager]

Although limitless conversational forms were applied between members cross-departmentally, overtaking tasks are distracting in some occasions. Therefore, as externalization specifically in format of documenting events was missed here, job descriptions lacked and in consequence, departmental boundaries appeared indistinct. In this situation, it is not surprising that more than one middle manager may undertake a particular task lead the repetition of jobs and the waste of time over acquiring knowledge. Then again, a manager at Logistics Department turned around the discussion to defend this as a strategy to prevent knowledge loss.

Even though abovementioned shows that learning and training courses widely facilitate individuals at different level, here it is not a systematic procedure of managing knowledge creation and interestingly an interviewee affirms this and replied:

“Yeah. We’ve got enough people who know enough of it.... There are small gaps so our company, we’ve got a piece of software that just runs our company car scheme. We wrote that fifteen years ago. The people

who wrote it have gone. We've got nobody who knows how that works".

[IT Manager]

As in this case, the induction lasted four weeks, spending half a day with a number of employees from relevant departments while another recruited employee in the same department was not able to take similar manuals since no copy was left at the time. When I asked about the internalization mode by inquiring about the appropriateness of documents, the Carrier Manager positively reflected by stating that:

"Quite lot was new for me. Because, internally there are things happen here which completely differ from Harrods to me. Things are bought directly from suppliers where in Harrods things are bought from buying houses. So, in there you do not deal with individual suppliers". [Carrier Manager]

Although as also highlighted by Logistics Operations Manager, the supplier manual has information about account procedures, how to package garments, what type of cartoon is needed to be used, how to do labels, how to fold garments, how to load the containers, what type of hangers and barcodes are needed. As far as the retailers are concerned, it has the lead-time chart which explains for each origin what the deadlines are and when they need to hand over the goods. This positive reflection mainly comes from the fact that freight forwarders provide the manuals and not Debenhams. Otherwise, as stated by Vidal (2007), the degree of informal scenarios across the departments may damage the standardization of best practices and it lead to the loss of systemizing knowledge management: "While the informal teamwork may work well given the current organizational members, it may be hard to maintain such a system across time without any formalization and there are other synergies that may be lost due to lack of formalization".

4.2. The Excluded Middle at Benetton

Now that we have examined the core approaches that constitute the knowledge creation at Debenhams, we shall look at how SECI modes are constructed throughout Benetton by certain key possibilities. These possibilities revolve around investments in vertical information systems and the employment of key people to manage key

places, which then serve to take the process forward to supply chain relationships. By following an empirical closure of tasks, the unnecessary tasks were reduced so that the knowledge creation process was concerned with task decomposition and interaction between organizational units (instead of individuals), i.e. organizational and knowledge interfaces. Here, knowledge creation modes from socialization to internalization are illustrated to unpick exactly how these modes are performed and what effect they have on the overall outcome, compared to the case at Debenhams. While at Debenhams, knowledge creation is mostly processed through the hierarchical channels. At Benetton, the company establishes knowledge flow for any particular task, which is routed in accordance to the logic set by the top management, rather than the accumulation of what individuals offer. At Debenhams, there are many ways of achieving this when the main thrust of it at Benetton is to spend time with specialists who work for top management to mechanize the process.

At Benetton, the relationships are highly affected by knowledge creation capabilities generated by the involvement of top managers. In great contrast to Debenhams, the size of the company and the involvement of technology weaken the role of middle managers as the knowledge creation motivators (Payakpate, 2008). Five members of Benetton family have a great impact on shaping the knowledge management of the company in a hierarchical approach with decision-making following down the branches. It seems the definition of knowledge creation, however, is by no means similar to Debenhams and the role between the “Grand Theory (what ought to be)” from the top management, and the team members “(what reality is)” are controlled differently (Nonaka and Takeuchi, 1995). Noticeably, this top-down approach to create knowledge is reminiscent of what we learned from Taylor’s scientific management philosophy (1856-1915), where the optimization of the process are carefully measured (externalization) to discover a ‘best practice’ (combination) that would be thought to other individuals (internalization). Thus, the act of critical thinking (socialization) is with top managers and those who operate are just executive individuals. This ideology is further explicated by a Regional Manager, who believes using socialization with individuals is a barrier to communicate knowledge:

“Another point of exchanging ideas by articulation is that we no longer live in the times where connections were mainly based on social relationships, as was the case for meeting of a seller and a buyer in a

crowded street... Today is the time of connection through huge international networks...it's not that kind of interaction that has no power, I think, in influencing business strategies". [Regional Manager]

It certainly demonstrates that, in fact, knowledge creation theories of what does and does not constitute knowledge-based companies are not always in line with the prevalent definitions of the world of business as the practical framework lags behind that of real work issues. While these companies all introduced as knowledge-based companies, they do not follow a role model for managing knowledge. For instance, since the operations are IT oriented, influenced by the 'fast fashion' concept, Benetton depends on a dynamic exchange of knowledge throughout the activities. Thus, general managers have elaborated a specific way of thinking, dissimilar to the established middle management thinking at Debenhams. It is to productively face with "humanistic depraved disorders", as said by the above interviewee, so that performance can be monitored closely.

As a result, when it comes to socialization of knowledge, I found social relations are more in forms of procrastination than adding value to the knowledge creation process when many highly developed roles are replaced with technological revolution at Benetton. As an example, to ensure that individual tasks are performed to a high standard, in R&D teams, real time status of project portfolios is employed by all members for putting uniform data control into effect. The individual progress reports (IPR) are more traceable and maintainable allowing managers and board members to effectively recognize the personal contributions to a project.

Therefore, it feels like joining knowledge creation process for individuals can provide them with the platform on which they can only be good learners and work to please their managers' desires, so managers are obliged to externalise knowledge by documenting the individual daily operations in strict manner. Passing through the conversion of tacit-tacit knowledge, a Logistics Manager described the partial impact of externalization process at Benetton to admit that the knowledge creation process is a dynamic conversion of tacit-explicit knowledge. Here, in the form of writing reports, a new employee describes how similar the environment is to the description in the manuals:

"It can be very time consuming to believe that information holds true only because they are written down/published. This can be misleading when

people indisputably accept published materials, only because they are composed beautifully, without the regards for the reality of their content”.

[Logistics Manager]

By analysing the documented files, Benetton ensures that the Ponzano Vento HQs’ standards in Treviso are internalized to the other individuals to be used later in the organization (Nonaka *et al.*, 2000). Seeing these documents as the potential sources of knowledge, Benetton equips teams with manuals taken from the previously written reports, the past practical successful stories all learned from experience in a way, which makes knowledge genuinely easy to share. After introducing a number of software packages, an IT manager continued to demonstrate it is not only about the capability of producing explicit knowledge but also tacit knowledge is greatly appreciated:

“These are the computer systems that we have leaned on since they became the priority in our working environment. As such, when we attend a meeting, we are fairly certain that the participants all have some background information, so when an idea is expressed, everyone is assured of the link between this idea and the knowledge behind it”.

[IT Manager]

However, team members’ lack of motivation to elucidate their existing mental structures exposable in informal meetings to uncover innovative solutions (Bock *et al.*, 2005) may preoccupy staff with their own knowledge boundaries in confrontation with systematically structured job routines at Benetton. Although the push towards documentation bans individual secrets, the individual knowledge boundaries prevent tacit knowledge to be shared.

4.3. Adolfo Dominguez’s (AD) Hierarchical-Strapped Knowledge Orchestra

At Adolfo Dominguez (AD), with slight differences to Benetton, knowledge creation process is mainly affected by capabilities generated from the involvement of the top management. At AD office, the number of employees is relatively smaller, the relationships are less complex, and the organizational chart is quite traditional. Adolfo

Dominguez Fernandez dominates the authority of decision making, to a great extent, in which orders and ideas are largely superseded by him individually. The main innovator is the leader in a rigorous style of managing knowledge, which is less socially supportive.

While at AD, the friendliness is observed between individuals in each hierarchical level. It is less significant between individuals of different departmental levels in the chain of relationships. Considering AD as a high technology company, it stimulates creativity by employing knowledge systems for providing a variety of virtual environments for enriching explicit knowledge to exert a pull on complex calculations for optimizing people, processes and products.

According to my observations at AD, in contrast to Debenhams where time is less valued, I witnessed a method of training staff for managing time by implementing a tool that asks employees to indicate the timeline of each allocated task. This sets the scene for the team managers within the departments to configure employees' perceptions on the timing of the projects. Again, in contrast to Debenhams where the creation and loss occur affluently, since AD is an IT dependent company, the control of knowledge is systemized by computerized facilities to a greater extent. AD offers project reports with regard to what and how it was done previously. One item that stood out is the ability of combining the result of knowhow problems in various ways for various organizational roles by an advanced integrated intranet service available to staff. Since the completion of combination mode is extensively implemented, an analyst focused on the content of the documents and explained how conversion of explicit to tacit knowledge occurs in the internalization mode by directing interesting views to relevant individuals. The implementation is in four stages; categorizing, building a knowledge warehouse to interrelate related comprehension, enable the relevant individuals to contribute in knowledge flow, and expand the use of arrangements for detailed categorization of knowledge.

It is claimed by an IT manager that the company is grown to that level which when the CEO asks for detailed analysis on information for an optimization report and databases on products, information are always in hand; "all the transactions can be controlled from A-Z vertically and horizontally". [IT manager] This confidence shows how easy it is to recall the outcome of past activities, as initiated by staff, and how quickly the search combines knowledge with previous job fulfilments.

This could be an effective strategy at AD, very similar to Benetton and contrasting the IT competency at Debenhams; but having IT support for processing current explicit knowledge and preventing the loss of exiting knowledge is only one side of the story. The other side is holding the front-end model of innovation, socialization activities, for transferring tacit knowledge in new knowledge creation cycle (Nonaka and Takeuchi, 1995 and von Krogh *et al.*, 2000). If we add to the above the fact that the team collaborations were not observed as frequently in any situations or their likes, compared with Debenhams, we conclude that socialization process was massively limited. This led to the organizational knowledge creation opportunity wasted, as the employed strategy could have captured the employees' tacit knowledge in social contacts. In fact, as Nonaka *et al.* (2000) notes, this limits the career structure, which prevents the identification of the weak logic and empirical link between innovative visions to create knowledge.

For instance, it was noted at AD Financial Department that when staff only relied on written stories from the peer employees who work in other departments, the collective nature of knowledge reduces the sense that can be learned in direct discussions. This is mainly due to the fact that the key managers are not personally known and when things like stakeholder analysis is reported beside numerical data, there is a lack of individual influence come over to expose humanistic side of knowledge. In the following quote from an interviewee in Merchandising, this brainwave can be clearly followed: "I really obtain the knowledge and put it into the better-quality picture, to acquire the pieces, and say well what can I do with all this knowledge." In this brief line of expression, knowledge creation seems well performed to only a certain level since the individual left out to answer where can he go (i.e. socialization) from here when social contact is rarely systemized.

So when a merchandiser looks into a report written by a colleague, he is getting exact knowledge of a person's aims and objectives, but how that colleague has positioned his line of thoughts, which are heavily correlated to his own values, may not be understood. In other words, in order to acquire his tacit knowledge, this merchandiser must relate his colleague's mind-sets to the framework he draws on the spread-sheet (within the wider context) in which the collaborative work can exist that other individuals employ it. Therefore, when an individual is expressing his idea he is actually embodying himself, to a certain extent, while merely documentation bureaucratically constrains him, leading to isolation of individuals.

To demonstrate this variation in approach to knowledge creation in another example, the brand recognition of new employee at AD is upon internalization of explicit knowledge by reading secondary sources. It is claimed that AD's fashion products are self-explanatory due to their design peculiarities, though my observations prove that sales associates make insufficient conversations. Their lack of enthusiasm to socialization probably correlates with their lack of technical knowledge, as explained by Taskin and Bridoux (2010), lack of professional expertise and the knowledge of customers necessary to complete the job routines. Rather than motivating team members to elucidate their individual mental structures, which can be exposed in informal meetings to uncover innovative solutions, they are preoccupied with their own knowledge boundaries in confrontation with systematically structured job routines. Below, based on the given comparative analysis, the main contributors in processing knowledge creation at intra-organizational level are identified and with sentence to the managerial strategy in controlling types of resources, the role of individuals in converting knowledge in line with how they are positioned are illustrated.

Table 9. The comparison of the recognition of knowledge creation process at intra-organizational level

	Debenhams	Benetton	Adolfo Dominguez
Main contributors	Middle Managers	General Managers	Top management
Allocation of individuals	Network	Hierarchy	Chain
Main asset	Social capital	Structural capital	Structural capital
Organization	Large headquarter - Team-oriented Affiliated relationships	Medium headquarter - Self-organizing seniors	Small headquarter - Staff use manuals
Management processes	Managers as facilitators - Co-create knowledge with team members	Managers create personal knowledge -Partial idea generation is premised	Managers focus on the expected outcome - brainstorming less allowed
Intra-organizational	Tacit - shared in varied forms embody in	Explicit throughout the organization but	Explicit – documented and

knowledge	human relationships	mixed in managerial level	computerized
Weakness	Lack of control over the individuals	High reliance on senior managers	High reliance on top management

Now that the likely methods of involving knowledge creation in intra-organizational relationships are understood, we have a clear idea understanding of the value of their knowledge resources. In supply chain relationships, we will turn to inter-organizational impacts in order to see what the complexities are and how these strategies affect the knowledge creation process in confrontation with those global challenges.

4.4. Conclusion

In addition, this chapter provides the background for the rest of the study in terms of looking at key issues, the degree of top management's understandings of the specific benefits and their willingness to provide support to knowledge creation process, the set of norms, values and organizational practices that encourages teamwork, cross-functional communication, and cooperation and management style where managers share with the rest of the members on influence in the decision-making process. Here, I seek to investigate how middle managers affect the entire knowledge creation process, how they encourage conversion of knowledge between general managers and employees, and how they recognize complexities. These are all established to be multi-dimensional processes. Now, changes throughout the relationships are undeniable as the individual knowledge is socialized into the group knowledge moving from organization to supply chain. Moreover, the notion of training is underlined as the basis of how socialization is attributed into knowledge creation process, and it can also be collectively created and therefore potentially shift through externalization mode and so on. This chapter then demonstrates how meetings could not be enough to guarantee the effectiveness of the process as complexities can occur in combination of acquired knowledge and then the internalization step when overlapping job responsibilities can be a challenge. Therefore, it presents an analysis of threats to knowledge creation, providing a portrait of problematic deviations from SECI.

5. Downstream Knowledge Creation

In contrast to the literature, the foregoing indicates that these companies process intra-organizational knowledge creation subjectively and core attitudes and beliefs that constitute knowledge creation are shaped by certain key contingencies. These contingencies revolve around knowledge resources, which then serve as platforms for converting knowledge from one type to the other type. While neither staff nor managers defined knowledge creation as introduced in the literature, studying the supply chain would potentially highlight the challenges in inter-organizational relationships and it allows unpacking how resources are employed to affect knowledge creation at this ontological level.

Managing the supply chain again is therefore a matter of social as well as technological employment and control. As such, the supply chain can be a social opportunity and the work of each individual in any of supply chain organization can lead the other tier of the chain to exist as an entity in the competition with other supply chains to gain performance advantages over price, quality or lead time to attain customer satisfaction. The principles of these potential relationships are opportunities to develop decision-making accuracy regarding the style and inspiration of the final product in the market.

We therefore need to know how resources are mobilized, whether technological resources such as institutional settings, tools and equipment or social resources such as workforce, partners and agents or the mix of the two. The starting point in supply side of chain in knowledge creation is the design capacity, which, by elucidating the appropriate design, leads the whole production stage. As touched on it in the literature review chapter, in the fashion industry, colour, print, fabric, trim and styling detail are some of the characteristics; a fashion designer could manipulate to impress customers with the outcome. Therefore, in each stage of the chain innovative individuals play essential roles, for their organizations and so do their organizations to supply chain. They employ creative applications of knowledge and while knowledge it supplies is the essential raw materials, it is the creative act that is the foundation of an innovation (Yusuf, 2007).

According to the analysis of cases in this thesis, while the design stage is mostly completed in-house at AD and Debenhams, Benetton greatly use agents who previously worked for them. Either way, samples of products are manufactured to a

certain volume and fitted before actually being manufactured. Then, depending on the availability of technology, there is always the likelihood of late modification, as was observed at Benetton which had the competitive advantage of production flexibility. Thus, reducing the actual times for designing, technological capabilities (i.e. CAD) could also help to produce patterns with a better accuracy of measurements.

In this section, similarly, at manufacturing stage, based on the volume of outsourcing, various scenarios occur in which, for instance, unpredictability of customers' shopping habits cause cheaper global manufacturers to not meet deadlines when their insufficient plant capacity delay orders. These long distance relationships also instigate financial complexity in fulfilment of matters such as duration of agreement, employment obligations, prices and stock payment terms, and discount/mark-up policies. Especially, when companies like Debenhams believe the strategy of utilizing face-to-face relationships could be executable even in global dimension. Hence, training and assistance to ensure that the manufacturers are capable of implementing operations to handle the supply of products and services including customer service and inventories, are mainly evaluated based on the conversion of tacit to explicit knowledge in the first two modes of knowledge creation.

Logistics is another stage at supply chain, which includes the transformation of shipping from global locations to worldwide destinations by road, air and sea. While, environmental unfriendly airfreights try to be avoided, managing logistics operations could be impacted by the availability of EDI technology in which give a lot of savings and visibility in decision-making. Implementing EDI technology at both Benetton and AD process knowledge creation more viably in combination mode but for Benetton the agreement on contents and format of exchanged knowledge are more collaborative while for AD it is more informative with less opportunity for business partners to engage in the process.

Lastly, receiving and checking the containers, checking the seal, off loading them, and counting the contents all are investigated in the distribution stage. While at Debenhams a strategic partnership with a well-established company provides prestige and visibility of operations, at Benetton the mechanized conveyors that are equipped with electromagnetic sorting system deliver the boxes in the storerooms without human intervention. Success in creating knowledge at this stage also depends on gaining knowledge from the requirements of retailers in upstream chain, which

recognize the necessity of strategy and tactics to delivery products with strategic considerations. Nevertheless, in supply chain neutrality of creating knowledge in a particular stage is not the objective but throughout the chain to maintain credibility in keeping with the SECI process. The theoretical model rooted in the participation of individuals, their unique behaviour as well as the technological support for enriching the result of their involvements. It is interesting to note that supporting resources of any type are not held to the same standard of impartiality. Looking at the relations within these supply chains will allow us to elucidate in what extent the creation of knowledge depends upon social or technological capitals.

5.1. Design

From Outsiders to Insiders: Designing External Brands for Debenhams

The usual first point of entry into the fashion supply chain for a researcher is studying the design of products. It is a central manifestation of brand identity and therefore circulating this identity through design can be a major concern (Nambisan, 2002). For Debenhams the creation of design language requires covering the design of own brands as well as the external brands. Whichever, the designers are working into groups of specialists in men's wear, women's wear, child's wear and home. For instance, the printing textile designers in men's wear cooperate for deciding on the qualities of patterns and use concepts to define how the unwitting ideas are drawn. These groups provide the context in which the designers operate and they must contextualize themselves within their roles so that can be clearly understood by other groups in the design tier:

“... within our team, we have, the way we split our responsibilities is each person on the team is responsible for one or two of our kind of tracker programs... and it's their responsibility to make sure that their program is updated regularly enough to be in touch with the business needs. So everyone has responsibilities for innovating for their program and similarly, with the divisions across the business, everyone has one or two divisions that they, they work across divisions, but primarily, you know, so I work in women's wear. So it's my responsibility to make sure that with the projects we're doing with women's wear, we use new methodology and we're innovating in those projects. So we

each have a responsibility. I think that helps to motivate people if they've got their own responsibility, but then as a team, we'll sit down and think okay, what new things you want to do this year". [Designer]

Although being a designer comes from a very individualistic conception of knowledge creation, this process to a large extent centers the social interactions that designers at Debenhams makes to foreseen market trends. Nevertheless, it is noticeable that a few numbers of brands have designers who design products for a range of audiences and therefore each designer must be familiar with other groups of designers, forming a collective voice of a brand firstly, then the company. In line with Polanyi (1962) by observing the master and following his efforts in the presence of the art, including those, which are not explicitly understood, knowledge designer uses tacit knowledge across the groups to act in response to other design ideas.

Here, the likely question is whether or not the same strategy for converting knowledge and design references are employed for in-house brands versus designers' brands. This is especially the case for Debenhams, which offers larger number of product lines for customers to have a choice of variety in options:

"So our brands are different either in the style of clothing that they offer or the occasion of clothing that it's for, so smart or casual, or the price point that it's at which relates to the design quality... in a way, is linked to the style it is aimed at. So we have brand maps which show where the brands are supposed to sit against these things, and yes, it's part of the buying and merchandise team to make sure that the brands have their own identity because no, you don't want all your brands offering the same thing". [Designer]

What makes the design of external brands, such as Jasper Conran interesting is the fact that, Debenhams in-house design teams sketch but Jasper, a visionary designer, who has an overall decision-making authority feed his knowledge in format of the general briefs and directions. He justifies the strategic significance of design for the Jasper's allocated design group and accordingly they call him the 'single inventor' to correspondingly emphasize that he is the most creative member in the team who generate an idea and others communicate it. Therefore, master designers such as Jasper Conran are extremely important in serving as role models for junior designers

that in most cases freshly graduated with an Art degree. This young generation is potentially the indication for a shift from what the Jasper Conran is now and what it will be in the near future.

Hence, the design team learns from the brief, adds more innovative characters (e.g. embroidery) and starts making it happen. The quality of work itself is not magnified at this stage, the essence of idea that lead onto the body of work sounds to be the principal goal. The team members are all trained designers with technical knowledge of each aspect of fabric production. At the same time, they have great understanding of fiber. Particularly, their learning is continues as they have to update their know-how not only about new developments in textile designing but also *Jasper*, the designer.

By advising on design ideas, Jasper teaches the design staffs to express their visions in order to widen original thoughts in a two-way relationship. Obviously, the plan is to design Jasper collection including dedicated lines for jackets, trousers, jumpers and t-shirts. In order to accomplish the process, each line has its own experts. According to a team member for Jasper brand, tacit knowledge of a desired design is created from involvement of a designer in sampling design consulted with core customers in focus groups, interviews with like-minded people, single purpose-built surveys and face-to-face meetings with Jasper Conran:

“...it’s really important when we’re doing focus groups and things, that we talk to the right customer. For example, you know, if we’re doing some work for Jasper Conran in menswear, I don’t know if you know that brand but we need to make sure that we’re talking to a man that we believe is the Jasper Conran shopper. If we got a 70 year old man who shops [another brand], he’s not going to tell us [about] Jasper Conran...” [Designer]

In men’s wear, this is why for choosing a focus group, the most important factor is that right customers are invited for discussion. This is also in accordance with Michael Polanyi’s (1985) religious analogy that explains the advantages of this collective mindset toward knowledge creation as it is observed between Debenhams’s design members “... It is like an obsession with a problem known to be insoluble, which yet, unswervingly, the heuristic commands; ‘Look at the unknown!’ Christianity sedulously fosters, and in a sense permanently satisfies, men’s craving for

mental dissatisfaction by offering him the comfort of a crucified God.” (quoted in Igoe, 2010)

Lastly, Jasper visits Debenhams to give his final idea on the designed briefs or selecting a concept, which worth it to be developed out of a number of competing proposals before items are sent to the manufacturers in the next supply chain layer. It is seen here how individuals feed into issues of knowledge creation, which in turn have a positive impact on the work in process, something that is explored in the conversion of tacit knowledge to explicit knowledge in the SECI process. As a result of this collaboration and teamwork, individual designers constantly compare themselves to their master, i.e. Jasper, while they accept it; they pride themselves on the effectiveness of their personal work.

Best Laid Plans When Mechanization Is Lacking: Designing Own Brands for Debenhams

Design specialists are the crucial part in designing own brands and their roles have a direct effect in shaping ideas. Nevertheless, due to the representative importance of designers like Jasper in external brands as discussed above there is increasing pressure on design team members to be more in a creative position. Hence, in designing own brands designers seek to replace a master designer with suppliers who add value in creating knowledge, as we shall explore further on.

For own brands like ‘Red Herring’, the designing process is entirely internal. As a result, the internal design teams are the knowledge creators themselves. In other words, the design team members know what the Red Herring hand signature is as the brand was generated by their own unique ideas. As mentioned by a designer, there are four steps toward the completion of designing process in relation to In-House products; the conceptualization of innovative designs, setting the design samples and lastly designing fabrics according to the emerging trends in colours and textures. It was claimed by a design team member that innovative idea generation is the crucial part of designing own brands, highlighting the challenge of converting tacit knowledge compared to external brands’ designing process which individuals like Jasper externalize the knowledge to Debenhams design team members. Compared to the designer brands, own brands engage with more experimental attempts and improvisational design skills, which help them to learn from “small losses” (Brown

and Eisenhardt, 1995) that previously have not come true in future Debenhams projects:

“We might have a session every six months where we sit down and think about, we might look back and think about all the new things we’ve done in the last year, which is quite nice, and then look forward and think if we’re going to do three new things this year, what are they going to be? And then we also run, each year, a project called Future Debenhams where we, it’s kind of a more visionary project to think about. Where should Debenhams be in five years’ time, ten years’ time? What new product categories would they like us to sell?” [Strategy Manager]

However, another design team member responded to my question about the process of design co-creation for Red Herring by stressing that Debenhams collaborate with a number of suppliers (i.e. ‘Maytrainee’) to receive design consultancy. The management of Maytrainee has the know-what for every piece of Red Herrings to explicate the manufacturers’ role in the designing phase. By taking rails of garments to the Debenhams, manufacturers distribute their works with Red Herrings design specialists to share experience with the teams for their current practices. To acclaim supplier tacit knowledge co-creation in Debenhams, it may be interesting to quote Christian Dior experience of working with suppliers that a supplier “not only expresses designer’s dream, but also stimulates his own ideas. It can be the beginning of the inspiration. Many a dress of mine is born of the fabric alone” (quoted in Dorner, 1975).

Beside the fact that the design process, either for own brands or external brands, is satisfactorily socialized, the knowledge creation process is limited at Debenhams due to incompetency of employing computer-based tools in the process in order to acquire designers’ novel ideas to the next tier. In order to do this, designers have to be in contact with and acknowledged by virtual designers in some way and one of the easiest way to move on is employing computer aided design rather than simply using pencils and papers, cameras, workstations, image processing tools and photocopy machines to externalize knowledge which obviously are not sufficient to convert explicit knowledge (externalization) to a more complex knowledge (combination) (Nonaka and Takeuchi, 1995). These materials would definitely be essential for providing a wider overview of the informative prospect. However, the

overall map that is the production of this level of knowledge creation should be used to forecast the placement of linking suitable knowledge in line with each other.

This is why having some IT structures support their work and introduce them to manufacturers properly. In theory, the SECI process differs from this individual-driven approach whereas combination of explicit knowledge is necessary to connect design capabilities to computer-aided design systems for in-depth sample elaborations and the maintenance of consistency among different teams (Nonaka *et al.*, 2000). In addition, Findeli (2001) magnifies the consideration of the complexity of design process and he emphasizes on the necessity of a systematic model based on complexity theory and practical philosophy, which surpass ordinary and casual models to portray the design complex system. How individuals who are the ones that can allow or deny the generation of an idea in their meetings do not hold an essential role in screening those ideas for the further development of concepts in combination mode which then will be the motivation for the design of next season products when they get back and look at their previous jobs (i.e. conversion of explicit to tacit knowledge). For a knowledge-based design team, therefore, creating knowledge is a process between self, groups, organization, supply chain and the design, which requires the aptitude to communicate the identification of idea in a dynamic way.

Leaders without Followers: High Tech Design at Benetton

In comparison to Debenhams, at Benetton, the socialization mode is less effective between design teams, since they collaborate vertically in which equal opportunity of involvement is hardly found between design managers and the rest of team members. Although, a design manager introduced a systematic approach for converting tacit knowledge in four steps of idea generation, research, sample explanation and strategy presentation, but I did not observe any practice that follow the theory. Here, design managers with affluent expertise in designing process and in planning design models are the only entities that have sufficient breath and depth of tacit and explicit knowledge of both creative and technical design to maintain the process of knowledge creation going. For instance, optimization of shapes and the creation of complex part of a knit garment demand specific knowledge to understand the relationships between the influence of visual design and design with 3D view CAD software in relation to knit outfits. Employing design software supports them to predict future trends and convert design ideas into products quicker. Consequently,

manufacturing processes will move towards using small batches of productions. Here, the employment of high profile designers seems to be inevitable to advance next stage of operations and manufacturing, to reduce material waste, increase the availability of time and ease the transportation. So, it is believed only through design exposure of these specialists the work can be interesting enough for their customers that means to limit the territory of knowledge creation resources while even bad reviews still provide designers with much-needed attention in the fashion industry when there probably is no right or wrong:

“Fashion needs special attention. It is not a bread to stop hunger pains. It is what people do not need but tend to have for a better life. All comes with luxury goods definitions”. [Marketing Manager]

Hence, individuals collaborating in designing at Benetton are at the bottom of the social hierarchy, especially fresh designers and therefore they have difficulty in finding an open space to socialize with their knowledge. This approach is reflected in most of the literature on the use of technological sources in relation to E-commerce and supply chain management and Gunasekaran and Ngai (2000) follow on Elliman and Orange (2000) to look at the utilization of information, arguing that technological angle of managing knowledge includes benefits (control, integrity and visibility) that otherwise supply chains failed to achieve. Unfortunately, like much of the literature that touches information technology, how they define what is the use of technology in knowledge creation is unclear. In supply chain knowledge creation, technology is linked with the creation of explicit knowledge (and not merely new information) which has to show proof of advanced planning of organizational knowledge but it also linked to the knowledge of individuals using their lenses of social expertise. Much as Gunasekaran and Ngai (2004) found in their study of reviewing the literature on IT in supply chain management, the technology is necessary but I argue it is not sufficient for legitimization of supply chain knowledge creation theory as the technology is not the sole source of knowledge creation derived by IT infrastructures (Sharma and Gupta, 2002). Lack of knowledge socialization threatens the fashion industry because it threatens the social boundaries, destroy transferring tacit knowledge which is why designers strive group projects in order to responding to market changes or managerial strategies.

Perhaps, the question here is how providing the market with effective use of leaders in design-manufacturing jobs can be transferred to the next generation of designers when junior followers are not trained to recognize advanced tasks likes of transferring needles, optimizing shaping methods or adjusting gauge.

Instead of paying attention to the creation of common physical spaces for the collaboration of members to begin knowledge creation with converting design tacit knowledge, computer-aided designs have made manufacturing operations mostly flexible here. Hence, the outcome of knowledge design creation, i.e. product design, is the core to make sure product manufacturing process could take no more than few hours and internal kitting machine manufacturing linked together with CAD software to work on virtual body images (e.g. scanning technology) for positioning the knit structures. The product re-design also elaborates a reformation of products by eradicating those lines which were not sold previously, and an explanation of successful collections classified by age in four groups of men, women, children and maternity clothes.

“The main advantage of automated systems that we use to create knowledge is to provide our specialists with required knowledge through their central knowledge warehouse and to ensure reliability of product knowledge by continuous updating as well as managing the changes in the design history”. [Regional Manager]

As we can understand from the above quote, this means that the main contribution to knowledge that the interviewee is trying to stick to is the combination mode which Nonaka and Takeuchi (1995) observe as a process of systemizing concepts into a knowledge system. However, at Benetton, employees are replaced with technology to sort, add and update knowledge into a variety of kinds and therefore expand new knowledge for their intentions.

To put into practice, the ‘state of the art software’ facilitates in-house design for Benetton designers and their design ideas are linked to computer-controlled product cutters and knitting machines immediately. Apart from the importance of design-manufacturing combination, the process implication is mainly upon internalization, where a very small number of people from highly appreciated local designers can generate lessons for design team members who acted more as copiers than creative knowledge sources and therefore they are greatly aside from the idea

generation process. In a recent paper from Wang and Ilan (2009), they describe a ‘sociological wrapping’ around the ‘creative act’. They propose that in order to progress design creativity as the result of knowledge creation, individuals should establish large cultural groups.

Even though, Benetton creative department employs fresh graduates to support the company but according to a designer, still after the leave of Head of Design, the achievement of success has become more difficult. Also, Fabbrica as the main communication centre has a key role in generation of knowledge to inspire ‘young social catalysts’. Likewise, Benetton attracted several young artists via local societies through cultural actions such as Fondazione Benetton Studi e Ricerche but still its industrial reputation owes to the level of mechanization of the design process. Hence, as argued by Chini (2004) since socialization addresses tacit knowledge, Benetton IT tools are not so pertinent in converting tacit knowledge. In another words, since the advent of fashion design is a societal activity, the recognition of style guidelines contains a socially entrenched process integrated with individual creativity before it get into the fashion system or become available to external supplier firms. Even at the inter-relationship level with suppliers, the high level of atomization prevents the manufacturers to “smell it” and to “listen to it” (Architectural Digest, 1988 quoted in Gale and Kaur, 2004). It is in disagreement with a well-known Parisian designer’s experience of fashion knowledge creation, Pamela Golbin, who identifies the creative relationship between designers and manufacturers as “everything evolves from the fabric, so your relationship with the fabric will change the outcome... let the fabric dictate what will happen, as opposed to using technicians to figure out how to produce a garment from a sketch” (quoted in Agins, 2000).

Here, while Benetton cannot purchase fashion knowhow packed into its specialized CAD/CAM software, Debenhams cannot process knowledge creation merely by acquiring its’ fashion design ideas without exploiting it. This stage therefore at these two supply chains somewhat divorced from the actual object of the model that value comes from the mix use of the two resources.

Winning Selection of Comprehensive Design Process at AD

As we have covered, maintaining purposeful relationships with a variety of individuals on a variety of ontological levels is necessary. Particularly, knowledge creation has to process with managing social capabilities, which are independent from

technological intervention for converting explicit knowledge. However these mental processes then need to be served by a level of technological support to not only explicate knowledge at externalization mode but also combine those with existing acquired knowledge to internalize new knowledge for individuals. This circular process is dynamically continuous and therefore individuals in a natural language can either utilize the content of knowledge or it can be formal to enable computers as well. Here, managing these relationships in the long run for designing products in the early stage of supply chain is therefore essential. Designers have to keep their mental connections viable and in every decision they make consider how these decisions may impact the entire supply chain knowledge. In practical terms, this is not as easy as in the theoretical model; there are all sorts of complications for competing real operational barriers, which can have negative effects on the implementation of knowledge creation process.

At designing tier for AD, the process of design is very similar to Jasper Conran's at Debenhams where design tacit expertise streams from Adolfo Dominguez, yet differs in using expert-system software for converting explicit knowledge. Since the design knowledge creation process at AD is the most stimulating, I spent an extensive amount of time scrutinizing use of socio-technological resources. Some concrete steps toward creating knowledge are evident here.

Since, Adolfo Dominguez is leading the management hierarchy as discussed in chapter four, the designing process is under his own umbrella. In particular, his academic background in fashion design allows him to play a key role in providing distinctive ideas. Nevertheless, team managers are responsible for implementing design techniques within teams to materialize his knowledge and expand it into products. The knowledge creation process here begins with sharing design ideas, as one employee introduced, 'think-loud', a technique based on the verbalization of thoughts that the members use when shaping a brief. Their voices are recordable and transcripts can be provided without distracting a designer. Then, I expressed my concerns regarding the importance of the designer's facial impressions in designing process as in the above-mentioned technique, non-verbal figures, are not transferable. He admitted by stating, "It [the selection of techniques] differs based on the objectives". In fact, he exemplified 'motion study' that individuals in a form of teams are able to receive the designer's idea by watching the steps, as they are taken. These

techniques are in line with what I have detailed in reviewing the literature so that as IT can never substitute face-to-face interface where knowledge creators can share tacit as well as explicit knowledge (Fahey and Prusak, 1998).

When I asked him about the role of design collaboration in knowledge creation, he jumped in by highlighting, the role of ‘prototyping’ and continued on by stating that in pre-scheduled workshops, design parties are asked to build quick prototypes using allocated materials. A week after, I was called for observing a circumstance where designers were given necessary materials to conceptualize new trends by using metaphors and suggestive pictures, which aim to inspire an idea – rather than precise communication- for merchandising a new fun look product for AD+ collection in front of general merchandisers. When pushed a little further to link the knowledge creation process to the performance indicators, he expressed the idea of AD Mascotas production line, which brought to the board, initiated in same sort of gatherings and developed when the outcome of the workshops were synthesized across the business. Here, a number of ideas comprising the fashionability of trends were described with expressions such as “snowballing into a can of worms” to show that the ideas was out of target and “changing leopard’s spots” for emphasizing on the taste of customers. These processes of decoding tacit knowledge to explain an intuition to other individuals who possibly are grounded in other teams with different experiences are important here. Nonaka (1994) notes that a metaphor is a step to convert tacit knowledge into explicit knowledge when imagination and symbols are employed to prevent concise analysis or generalization of a mental model that not every one is aware of.

An area manager at AD also expressed that in some occasions, the work of designers are exposed to local people in a designated area where attendees are able to visit samples of new trends in various forms of colourful posters, trend books or slide shows. In contrast to Benetton where customers become familiar with new designs via online catalogues, at AD since absorbing tacit knowledge for creative design has been found critical (Nonaka and Takeuchi, 1995; Golfetto, 2003), the area manager highlights to direct future collections “virtual visitors are never as supportive as those who come to visit in person...”.

At this stage in the fashion supply chain; individuals are actively seeking involvement by following unspoken rules as to what signifies a design knowledge creator. Then to balance tacit-explicit knowledge conversion, designers use 3D CAD

to match simulation quality for fabrics and patterns that facilitate the communication bases for cross-stage knowledge sharing to convert the created explicit knowledge to other designers. Here, the integration of real body shapes and volumes in patterns are developed to reduce needs for physical prototypes like what I encountered at design tire in Debenhams. Although in any one to one interaction the team members in each stage get mutual benefits from conversation, following figure demonstrates procedural steps with one-way arrows that begin with the involvement of the CEO and complete with production.

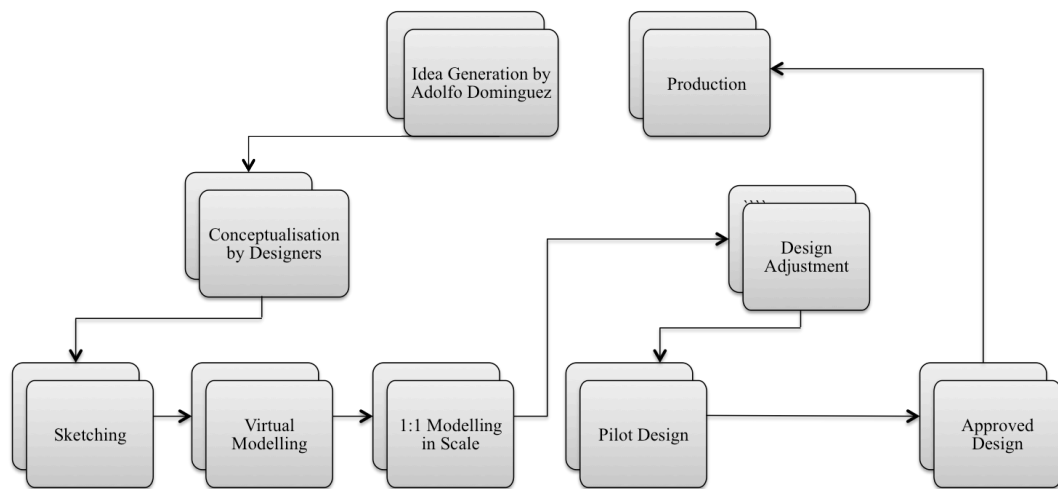


Figure 13.Design Process at AD

To bring to a close of the design stage, AD at the managerial level has found to lead a better understanding of knowledge creation, as the team members focus on those practices that produce intangible improvements, which are not subject to measure by traditional measurement techniques; therefore, considering challenges, Benetton neglects knowledge creation process even by having standard computer-aided design software and Debenhams rejects the investment on the infrastructure. At this early point in supply chain, the case companies have started to form an identity, which allows us to draw a line between social-oriented (Debenhams) and technological-oriented (Benetton) brands. While, as we shall explore, changes throughout the supply chain is inconsiderable, in this layer it relies heavily on the exposition of design ideas, which is taken from customers to the manufacturers.

5.2. Manufacturing

Out with the Old – In with the New at Debenhams

Once designers have started the knowledge creation process and understood the perspective in which their work needs to be positioned in fashion supply chain, they must be linked with manufacturers. This is mainly due to the integrative structure of this industry, as Dimitrakou's (2007) research of fashion industry demonstrates, skills such as innovative problem solving are key to success. In terms of what manufacturers could bring in supply chain knowledge creation process, certain platforms are available in ensuring task completions. Two categories of platforms particularly exist to a supply chain in the fashion industry, leading to use of social and technological resources for diminishing challenges: local sourcing and global sourcing. It is a strategic decision making choices to reduce cost of operations and therefore the trade-offs between local productions and outsourcing manufacturing. Hines (2004) provides an explanation of the main differences between these choices and the introduction of global supply chain as those, which mainly source from a range of locations all over the world to make a product that satisfies customers who may also be scattered globally.

This probably put an additional pressure on Debenhams in view of the fact that Debenhams is a department store with an extensive variation in product types. It is considered as a small business in comparison to companies like Primark. Likewise, its lines are very diminutive compared to its competitors, i.e. Marks and Spencer's¹¹ (M&S) and Next. This requires gaining profit over variety but less over the quantity and having wide variety of choices may lead the manufacturing contractors to play a critical role in the supply chain network. In another words, Debenhams is profitable if it successfully carries variety of product categories while the assortment is broadly on the average price.

Regarding this notion, a Strategy Manager detailed it here "The goal is to specify the product platform(s) around which the product(s) family(s)". The reference to 'product platform' refers to the collection of the frequent elements, in particular, using principal core manufacturing technologies. In fact knowledge can better be

¹¹ Marks & Spencer is one the top 6 UK retailers as it has a revenue of almost £10 billion operating in more than 1000 stores worldwide (Marks & Spencer's, 2010).

managed in clusters when the accessibility of resources are utilized and manufacturers save time to develop their tacit knowledge and fix their own knowledge boundaries.

According to some statistical data available during my observations, on average for 2011, 65% of the products are manufactured in Far East and 65% of that comes from China (i.e. Chindau, Ningbo, Shanghai and Shenzhen) and Hong Kong. Other 35% is brought from suppliers in Thailand, Malaysia, Hong Kong, Macau and Vietnam. Apart from that, 20% of products are originated in Indian sub-continent (i.e. India, Delhi, Bangalore and Chennai), Bangladesh, Pakistan and Sri Lanka. Still 15% of productions are made in the Europe and a great majority of the suppliers are in Turkey, Romania, Portugal and Poland and a speck from Italy.

As indicated in an interview with the Head of International Operations, while 20% of suppliers produce 80% of the products and the other 80% of them are contributed in 20% of supply, those who generate that 20% are equally important as they produce specialized products which are normally sold with higher price points and therefore better price margin. Also, the rests are more mass production specialists. The Head of International at Debenhams explained this as:

“Not one of our brands is produced in one country. So all comes from multiple destinations. If you look at the story, you’ll see the story comes from four or five different countries. So the knit wears come from China, the T-shirts come from Turkey. All depends on lead-time and fashionability of it. Men shirts, for instance, come from China. Fashionability of a basic Man shirt is not particularly changing”. [Head of International Operations]

In manufacturing tier, to scrutinize the knowledge creation process between Debenhams and its manufacturers (Figure 1), there was a time when one of the staff from the International Division informed that a new manufacturing base has had a potential for sourcing products. As soon as the proposal was submitted, a supply chain representative at Debenhams introduced a project team, which met existing carriers to finalize anything needed to be known about the new location. Mind storming questions were asked initially to motivate individuals to think critically and analysed the situation: likes of “what service can be offered? Is there any consolidation centre? Can Debenhams have hanging garments from there? Are they secure? What services

operate from there? Is it weekly service or is it daily service? How much the containers going to cost?”

Questions about the product development lead-time were found important for Debenhams, as past experiences have shown how costly the delay can be. That is what learned from the past experience of working with suppliers in China when manufacturers used to supply responsively but studies at Debenhams shows supply challenges have begun recently:

“Why doesn’t anybody working in the factories on the sea coast of China any more? Why all the factories are moving in land? What’s the impact? Why no Chinese people coming back to work after Chinese New Year when they all go home in the middle of China?” [Head of International Division]

According to the Head of International Division, It is mainly the consequence of the fact that Chinese people are now better to do with money and the support from government prevents them to work for cheap. Currently, from the time a new Chinese supplier receives an offer, the lead-time is six weeks to ship the products from China to the UK. If the products are required for the end of August, it has to be shipped in the middle of July. Then, the batches have to be ordered in April to begin productions in May.

This was noted that, the timeline for the likelihood of acceptance or rejection of a supplier highly depends on the availability of time that buyers at Debenhams provide. One manager who is in charge of International Operations described what knowledge-stimulating questions could be asked from manufacturers in advance to ensure the survival of the business in the competition with rivals:

“... So, how you communicate, how you develop it, how you listen to each other, how to learn from another competitor, can you beat that can you do the same sort of things?” [International Operations Manager]

In that case, the supply chain team has constant dialogue with the buying team and the Divisional Managers that may take from three days to six months. Here, what made me wonder was regarding the value of acquired supplier knowledge at the development phase in only three days. It certainly contrasts to the theory of knowledge creation, which a great emphasis is on the comprehension of differences in

the knowledge creation contexts to clarify the ambiguities. For some of the scholars, work routines are enablers to help coordination of knowledge over time to use the potentials (Feldman and Rafaeli, 2002).

To compare and contrast the situation, I probed the question in my interview with a Supply Chain Manager at Benetton who responded to my concern regarding lack of knowledge accuracy in decision-making for globalization of supply bases by stating that at Benetton, “former Benetton managers often own these [Benetton] manufacturing plants”. That means the experience of previously employed managers at Benetton enforces the inter-organizational knowledge creation where new insights can be emerged in overlapping domains of the supply chain members. Nevertheless, even at Benetton, none of the interviewees bothered to introduce a mechanized system to circulate knowledge at this occasion.

Back to Debenhams’ progress in managing a new supplier, as soon as the initial agreement is signed, the Head of Supply Chain team gets on the plane and personally investigates all the manufacturing facilities to make sure everything is up to standard and the new supplier is aware of Debenhams design identity. Subsequently, the internalization of knowledge in the format of supplier manual and human resource management handbooks are sent out to the manufacturing bases. It is in agreement with Nonaka and Toyama (2002) where knowledge is applied in practical situation at supplier bases introductorily and becomes the vase for new routines. Thus explicit knowledge such as manufacturing procedures is actualized through practice so that it can be the internalization of Debenhams knowledge to the new manufactures in the synthesis of the corporate and personal knowledge. Scrutinizing these manuals clarify what jobs they are expected to undertake at what level, and by reacting upon them, explicit knowledge can be embodied through individual experiments (i.e. learning by doing) (Nonaka and Toyoma, 2002).

After a short period of time, in another face to face meeting in London, the International Division asked supplier to share his team’s understanding for product delivery in the supplier manual, the legal rules of import and customs documentations. When it is confirmed that the supplier will work with Debenhams, supply chain and logistics teams are in constant dialogue with their allocated carriers. The Head of Import and Export explained the importance of socializing with suppliers and mentioned:

“I jump on plane every now and again. Just came from Bangladesh. I always make sure that two of my guys are with me for experience. There is nothing more beneficial than touching it seeing for yourself. So, I go around to factories and consolidation centres, conducting meetings and having conversations”. [Head of Import and Export]

To evaluate the outcome of meetings, the management assures that those people in the Import and Export receive updates regularly and feedbacks are argued in details at the board meetings. Meetings generally start with discussing challenges and as the Head of Import and Export explained:

“If I put the solution, there is nothing for them to think about. For me, I always think the best way is to let others learn everything themselves. There is no idea to be a bad idea. Every idea is good but it takes time. Have you ever thought about doing it in this way? We just keep on going and going and everyone is shared his/her experience”. [Head of Import and Export]

For further support in integration of manufacturing plants, a Debenhams Import and Export team established joint training with suppliers and linked collaboration when necessary as commented by a Head of International Division:

“Our suppliers are our integrated part. So we are in joint relationship. So, they advice us, they talk to us. They advice us on fabrication, the product types [and] how they see the trend in the market developing”. [Head of International Division]

Figure 14 is a visual representation of the way knowledge creation is processed through the various steps, shifting from International Division to Import and Export Department, which eventually lead to the selection of a global supplier.

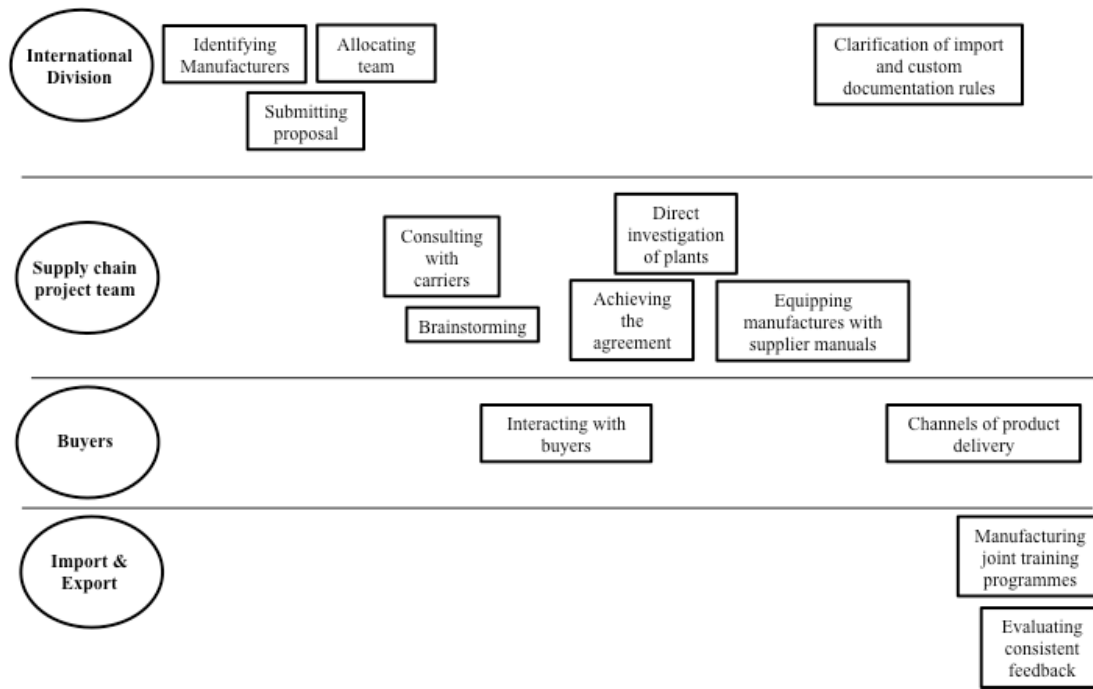


Figure 14. Supplier Selection Process at Debenhams

The knowledge creation process at Debenhams is about contextualizing the process of outsourcing the manufacturers within the fashion industry, which as discussed involves an understanding of the contemporary opportunities for cutting costs. This is also where again long-term versus short-term decisions can be seen in the tension between the human-based and technology-based supply chain approaches toward knowledge creation. Compared to the high value of tacit knowledge creation here, in global scale relationships, it seems an extremely low rate of technological innovation. This is due to the lack of research and development laboratories to inter-relate design ideas to global manufacturers and supply chain capacity to convert ‘soft’ innovations regarding both manufacturing processes and products development (Micelli, 2010).

It certainly is to say again that there is no systematic trend to demonstrate the formalization of the interconnections among the networks of suppliers for innovation led design and the involvement of methodical process to explicate dynamic knowledge creation. The more the knowledge creation is based on the tacit knowledge, the more the design creative idea is invisible; thus, the manufacturing does not have the potential to produce objects with an image that seems in accordance with relationship between the manufacturing complex technologies and artistic characteristics of a designer. These knowledge management control issues are incredibly important to for supporting resources. Once a supply chain culture is

created and the resources are positioned (either social or technological capitals) in a certain area it is difficult to reconfigure the way of operations when employees used to it “... a lot of the projects that we do, there’s a kind of similar formulae for how the projects happen since I began my career.” [Strategy Manager]

This, however, brings us back to the weakness in balancing strategic use of resources. At Debenhams, since many managers are now represented on boards of directors, they have an interest in the operations getting into global boundaries to raise the opportunity of decreasing the cost of production. Nevertheless, by changing the nature of operational structures, the technological resources should be balanced to provide a clearer visibility over the activities.

Running on Empty: Benetton Is No More Made in Italy

As covered previously, Debenhams generally go through a long period production procedure with relatively little knowledge combination support, where they are fighting for survival in a competitive world of fashion. For Debenhams, since manufacturers are scattered globally, distance relationships are a challenge for the success/failure of knowledge creation process. While Debenhams uses low cost overseas manufacturers to compete on cost, Benetton takes advantage of low cost offshoring strategies while still keeping premium lines in-house:

“There is some, but, you know, the idea is that the manufacturing complexity is different from a manufacturer to another manufacturer in some way. If manufacturing process in Benetton was exactly the same, then yes, you know, it would be really difficult, first for the customer, to know which product to go to, and similarly for our sales, we’d just be targeting one thing. So our relationships with the manufacturers are different either in the volume of production that they offer or the occasion of production that it’s for, fast fashion or standard lines, or the price point that it’s at which relates to the production quality or thing like that, or the age range which, in a way, is linked to the style it is aimed at. So we have production maps, which show where the manufacturers are supposed to sit against these things, and yes, it’s part of the supply chain and procurement teams to make sure that the manufacturers have their own identity because

no, you don't want all your manufacturers offering the same thing".

[Strategy Manager]

Here at Benetton, again, depending on the product type, lead-time, cost and quality, strategies differ brand-to-brand and line-to-line. At Benetton, each one of these lines has a time to market that differs between four and eight months to be prepared for seasonal launches. During the selling seasons, 'Trend' collection, with time to market between one to four months caters fashion sensitive products, 'Just in time' and 'continuative', with time to market between seven to fourteen days deliver collection's core products. In other words, 80% of products must be ordered several months in advance of the spring/summer and autumn/winter seasons. Then, the manufacturers complete the production phase in three weeks. However, the remaining 20% of products which can result from customer high demand can be fulfill in as quick as seven days.

The reduction of textile enterprises from 19.215 in 2001 to 14.719 in 2008 clearly indicates a growth of export from Italian traditional domestic manufacturing companies to newly industrialized companies (Lottersberger, 2012). As discussed in the introduction to Benetton, while in the early 1990s, global manufacturing was still less intense, later much of the production done by global manufacturers worldwide. As the market has taken over the legitimization of global supply chain, fashion companies who compete with Benetton have imposed a technological approach to gain a better understanding of the dynamic of knowledge management within various plants. Benetton is also not excluded from this widespread trend. It owns 55 firms, 40 of which operate globally. In this era, based on a given approximate at Benetton, in 2010, 40% of production volume was produced in Asia, 20% in Tunisia and 30% in East European countries and 10% in Italy. For Benetton, Olimpias is still the Italian main contractor that affords 55% share of knitted fabric production, 75% share of cotton woven fabric and 80% of wool products.

Besides the proficiency of the globalization of supplier bases, all cases choose to persevere with the idea that replenishment integration could be processed better while manufacturers are in regional clusters so as I heard from Debenhams and so that knowledge based production could easily be processed (Nonaka and Konno, 1998). As an indication, having manufacturing plants in production clusters allows Benetton to save more than 20% on transportation costs. In addition, according to a Benetton's

Strategy Manager, manufacturers tacit knowledge on specific orders can be transferred with more flexibility and therefore lead-time reduces during last year.

“We tend to do most of the manufacturing allocations in production hubs. So we’re not tending to use self-sufficient manufacturers. Whenever we do use them, there’s always a collaboration agreement in place, but at the end of the day, ourselves monitor most of their work in-house...”
[Strategy Manager]

As it was established during the interviews, the production system divided into industrialized and commercialized production (Table 10). The mainstream of industrialized productions, the most labour intensive parts including tailoring and ironing are outsourced to the neighbouring SMEs mostly and automation intensive phases likes of dying and weaving are kept in-house. Apart from industrialized part, the outsourced productions are applied in commercialized level which third-party suppliers approve global suppliers.

Table 10.Characteristics of production systems at Benetton

Characteristics	Industrialized Production	Commercialized Production
Production motive	Basic needs	Esteem needs
Production function	Supply driven	Demand driven
Decision making	Long-term strategy	Short-term strategy
Social involvement	Little communication	Intensive communication
Market knowledge	Large	Limited
Price elasticity	Inflexible	Flexible
Target market	Large	Limited
Spread of market	Large concentration	Geographical spread

In other words, the mainstream of these productions comes from Asian suppliers, made on long contribution to serve their warehouse in Shanghai. While, there as no motivation between participants to talk about tacit knowledge creation with distance partners, the only way they opened up mouth to initiate manufacturing socialization was for fast fashion and detailed products comes from local, European

and Mediterranean suppliers, which in many ways are depend on precise quality control and marketing research activities:

“...That’s always historic. It’s not [possible to come across global suppliers], you know, yes, it’s, they [Chinese suppliers] can bring knowledge from [for instance] when they were working with a competitor, but the only knowledge they know is from when they were producing for the competitor. They don’t know it today and I think fashion moves quite quickly. Knowing what happened to Gap [a competitor] two years ago, yes, it can help you but only in a limited context”. [Logistics Manager]

By putting all apples in the European manufacturers’ knowledge basket, Benetton hopes to maintain the analogies and metaphors of ‘made in Italy’¹² while taking benefits of ‘made in East Europe’ costs. This is in light of the challenges of the global hyper-competitive landscape that sees a growth of these newly manufacturing destinations. A Regional Manager at Benetton discussed that in the Eastern Europe manufacturing plants costs equalled to less than half of the Italian workers while the statistics shows their productivity is good enough. As far as it is concerns here, if the transfer of low-level production to other countries is unavoidable, then the knowledge creation should be processed with the same relentlessness between Italian designers and high-tech manufacturing companies placed in these emerging countries.

However, this strategy is still expensive in the current economical atmosphere in the EU zone. In one hand, huge investments are made to equip owned manufacturing facilities and direct controlling automating logistics processes for guaranteeing the total integration with the product life cycle, from orders to storing and delivery, on the other hand the price of raw materials and Italian production costs have been rising significantly which forces the company toward non-EU countries more than ever before (Deutsche Bank Research, 2011)¹³. While, for Debenhams the business model differs brand to brand but fashionabilty counts less important than

¹² According to Becattini and Rullani (1996), ‘Made in Italy’ refers to locally concentrated systems of SMEs within traditional sectors; these industries were linked to the concept of Italian regional industrial clusters.

¹³ The cost of raw materials particularly stands for one third of total cost of the product. This highlights the situation that is likely to be problematic for fashion companies.

lowering costs, for Benetton the strategy was “to keep fashion alive on a mechanized level” and that is how Benetton faces with a supply dilemma.

A Feeble Fix: Monopolization of the Process with Technical Knowledge at Benetton

As mentioned above, for local contractor employments, Benetton keeps the fashion knowhow alive that might otherwise fail when outsourcing to suppliers in lower quality destinations. In other words, the company encourages off-shoring the basic product lines to avoid the gloomy financial situation in Italy no matter if knowledge creation process is damaged socially similar to the large competitors such as H&M and the Gap, while premium lines remained in Italy.

Nonetheless, the outcome illustrates that, supply fundamentals for relevant goods, particularly cotton has risen significantly and China has balanced its economy more for domestic consumption. At the same time, as highlighted by Lottersberger (2012), China began a strategy to modify from ‘Made in China’ to ‘Designed in China’ as a part of the same plan to trim down dependency on value manufacturing, authorizing 27 new creative districts dedicated to design, prototyping facilities and research supports.

This has caused both Debenhams and Benetton to move from China to neighbouring countries more than ever before. Since, this shift could cause loss of the knowledge resides in manufacturers who had been supplying these companies for a long period of time; I shared my fear of the barriers for knowledge replication with a Logistics Manager at Benetton. He admitted that “it is exaggerated” to state other Asian manufacturers are as competent as Chinese counterparts for using computerized systems but a same level manger at Debenhams assured that other key long-term suppliers are asked to share their practical manufacturing know-how to train these new suppliers but in old-fashioned methods which once in a while is coupled by engaging producers in related industries (e.g. shoe and accessories) to share knowledge. Nevertheless, the loss of past knowledge is not the only concern here in global operations as the socio-political cultures in these outsourcing destinations differ and since Debenhams does a lot of outsourcing, its operations suffer more than other two cases for the creation of inter-organizational knowledge. While for AD

“...what we always trying to do is to have a contingency. The ways the buyers work is that they are really comfortable for going to the local

suppliers and buying products in there because they know everything from suppliers to the hotels and etc”. [Operational Manager]

For Debenhams mainly:

“The roots push us away now from China to Indian-subcontinent and the issue is we still expect the same level of service. But we are massively apart where in China there was an issue with workers in a manufacturing base. For instance, Bangladesh is very bad for strikes. The same thing happens in China. If it happens in China, the army helps it just goes away. But if you go to India all the people sit down on the floor and you can’t get any product to the terminal”. [Carrier Manager]

At the same time, the following comment by one R&D Manager at Benetton illustrates the type of situation that Benetton excels in creating knowledge by its networked manufacturing approach seeing that agile production reduces the lead time thank to the dominance of nourished virtual control “... it is stated manufacturing would not begin before an order is made from a store globally”. This quote is in line with Garber and Sarkars (2007) portrayal of an ideal strategy to deal with fashion products that a flexible manufacturing capacity is required to improve network design, which creates more flexible supplier relationships, and simplify transactions processing. Garber and Sarkar (2007), in addition, write that the key elements of responsiveness are reducing manufacturing cycle time and implementing a pull-based replenishment process. In other words, with short cycle time, Benetton is able to respond quicker to the changes as they have the required products/services available. In this pull system, Benetton would set the supply chain from raw material purchase to shipping in motion if the order is received from customers.

Regardless of whether knowledge is obtained by means of supply chain partners or created internally, supply chain responsive interconnections are crucial for replenishment strategies. Inconsistency in managing knowledge would stop these interconnections to work visible for other supply chain partners (Vollmann *et al.*, 2004). The importance of replenishment for managing suppliers from the stand view of a Logistic Manager at Benetton is the assurance “to not lose time, since losing money can always be recoverable”. Here, since best way to win time is to decrease complexities by activating knowledge systems to establish communication with

suppliers, replenishment time seems to have a more critical role in supply chain knowledge creation at Benetton than other companies here, where stores are able to hold products in the currently selling colours without carrying piles of inventory in the pipeline.

At the same time as Benetton benefits receiving the producers' online feedbacks in the EDI environment and the arrangement of cut-and-saw in small-lot cycles, during my observations at Debenhams, I found an extreme complexity of managing the replenishment time brought about by the excessive reliance on social capital, which damages the long-term plan, when the context is troubling. I asked a manager of International Operations for a real example of the way that Debenhams plan to resolve the replenishment complexity:

“For instance, Zara can produce cloths on the sea. Why [could not we] do that besides them really? And then they are good at turning fashion very quickly. We are not a fast fashion business. But we understand supply chain in a different way. And what's the impact on the supply chain of Debenhams”. [International Operations Manager]

However, he did not offer a solution to diminish the waste, but I found the vital point to his answers when a Regional Manager at Benetton was asked similarly and replied with emphasis on EDI technology:

“Benetton's ability to control during manufacturing process is based on a new technology that gives the best production possibilities and stock count systems, which helped us to foreseen uncertainties in manufacturing”. [Regional Manager]

In this case, as suggested by Nonaka *et al* (1996), IT solutions facilitates SECI process and therefore, technological supports minimize time waste in social disorders (e.g. cultural boundaries in case of the Chinese New Year) as this capability enables the company to retain control over wide spread suppliers. Specially as stated earlier, when variety is high and batches are low at Debenhams. As such, global sourcing is not concealed, but moves its innovative properties to the product, enriching its own nature; the materials become explicit through the shape of products, giving it a certain performance, a possibility of use and functional validity.

Out with the Old, In with the New: Taking Advantage in Painting Process

In the fashion industry, the process of products painting is mainly undertaken by colour technicians¹⁴ and it could take place whether before knitting or when products are manufactured but not yet transported. For Benetton the implementation of customer-paced painting of fabrics provides an invaluable distinctive power over Debenhams and AD. This is an important stratagem Benetton is really involved in bridging upstream and downstream knowledge creation process, when customers are faced with new interests, the acquired knowledge is to shield the company from the unsymbolized economical value resides in another supply chain tier. This approach very much is in line with what we have highlighted in the literature from Gibbert *et al.*, (2002), serving each customer in the ideal way is to change the voice of customers from passive recipients to knowledge partners. It signals that the management has a real long-term faith in engaging customers to the decision-making. In the quick response approach a faster supply chain causes overhead costs reduction such as material handling and system-wide waste costs.

Compared to Benetton, for Debenhams and AD, manufacturing of products begins with painting and followed by knitting into finished products. This process has led to effect in excess inventories of unwanted colours while increasing risk of out of stocks on highly demanded colours where sales may be lost or overstocks which requires large market down. A member of buying team put the process into words by explaining:

“...The approach is implemented to produce a variety of coloured garments in a short period of time. This is the way we could reflect the fast fashion market effectively”. [Buyer]

I shared my understanding with a buyer and he admitted that; “low demand products are still produced in the traditional way”. When I discussed the case with R&D people at AD, they unevenly reaped that the Benetton’s strategy would not simplify their supply chain planning, as AD is more concerned with the style rather than colour; “The investment on painting machines does not worth the costs saved in lowering the inventory”.

¹⁴ The task holders are in charge of creating the colour on demand of fashion designers.

However, by applying this distinguished approach, Benetton sales up to 10% of seasonal sales to develop this into a strategy for continued manufacturing during the season. Although, this method appears to rely on pull strategy, which the production are based on knowledge driven from customers, the safety stock kept low and the number of batch sizes reduced but it increases the cost of manufacturing in one hand and the logistics on the other hand. In other words, the manufacturing quick response strategy at Benetton adopts a built to order approach (BTO) where firms' job-size is not foreseen. Hence, while lead-time would improve, the increase in production launches might increase logistics complexity.

While Benetton is able to reduce downstream complexity by modularization and postponement where 90% of its sales are of standardized products with a 7-month advance committed order, Debenhams has not yet actually gotten to the point of having much knowledge of its customers' preferences to lessen supply complexity of this kind. This case is instructive for its attempt to implement a customer knowledge based operation, which is conveniently contracted out based on known stable plans. Therefore, quick response is based on customers' demands (not forecasts); the final stage of painting is deferred to the closest time to the delivery when marketing teams socialized enough to direct the manufacturing. In particular, it is relatively structured, though far from awkward approach to dissatisfying new product introductions. As shown in table 11, it is demonstrated how Benetton follows different strategy in comparison to Debenhams and AD:

Table 11. Manufacturing strategies at case companies

Benetton	Debenhams
Spin Yarn	Spin yarn
Manufacturing apparels	Dye yarn
Join parts	Finish yarn
Dye clothes	Manufacturing apparels
Finish apparel	Joint parts

Nevertheless, currently, supply chain structures in the fashion industry are counting these alternative practices for profit, so that something which had

previously just had crucial and knowledge value is starting to gain financial value as globalization itself or the employment of part-time staffs are becoming more mainstream. This will be discussed further in the discussion chapter using clear proofs as it is argued in this thesis that as a result of global complexities customer knowledge creation as an indication is becoming perhaps less important than cutting overhead costs and human capital that comes as a result of being careful with processing knowledge efficiently.

AD Is Keeping the Manufacturing in the Family

As we have seen, knowledge emerges from social value in the communication with suppliers as well as implementation of technological methods and therefore the individuals who are employed at work have already accumulated the capital necessary to ensure a better performance. In effect, managers' attitudes toward managing supply chains shape how manufacturers are positioned in the chain that could potentially impose knowledge creation. Changing manufacturers therefore usually entails a change in the direction of supply chain knowledge creation process. In this economical situation, fearlessly, AD utilizes its domestic manufacturers based in the Oerence, the high-fashion province. This province is located in the southern part of Galicia within the Spanish fashion crossways where apart from AD; other textile brands such as Carolina Herrera and Purificacion are located nearby. In contrast to Debenhams in great extent and Benetton relatively, having a large number of production facilities, AD's production and retail network seems to be centralized and less complex. This centralized system is characterized through the capacity of a regional production system to produce knowledge resources through cumulative learning loop along technological advancement as well as the employment of local research into a production system. This strategy, if do not be too costly, could inspire various knowledge creation opportunities that can be translated into supply chain support to operational activities.

Because the relationship between AD and suppliers is such a close one, it represents a major contingency in the conversion of knowledge in terms of how the manufacturing stage is represented by manufacturer and how AD creates work for manufacturers. This is why choosing a manufacturer is one of the most important decisions can be made and why supply chain team at AD is extremely wary of "getting the right one".

“Yeah... obviously we have different sized manufacturing plants across the country [Spin]. Not every manufacturer can have the full range. So yes, there is a decision that is made at some point as to what [design] ranges go for which supplier and similarly, if we’re launching a new product or range, we wouldn’t expect the production straight away. We’d start with a few suppliers to evaluate the performance”. [Supply Chain Manager]

In the AD case, the luxurious characteristics of products are key in attracting customers therefore undoubtedly low cost manufacturers in emerging markets are not proficient enough to formulate the production. Hence, the stress is on quality and innovation as the main sources of competitiveness and obviously ‘time’ is an important factor, which is greatly saved in the supply chain communications contrast to the following quote from a Carrier Manager at Debenhams showing some complexities in managing global supply:

“There is a big problem with fog in north of China to strikes to vessel running in the ground... I gave right down to what we pay to these suppliers and also the issues they have either operationally or administratively. Because, sometimes they have problems with invoicing and documentation and all those kind of things as well”. [Carrier Manager]

However, the complexities are not restricted to the management of supplying products but also the production coding schemes:

“Sometimes, I had a query this morning regarding classification of products. I went based on the style of the products such as long sleeve. I classify that as X09, which are the t-shirts and %100 cottons. So, I passed on this information to the supplier a couple of years ago. The supplier is preparing the certifications in China and China has rejected the tariff code we have used and they said this has to be a pullover. But I am not agree with that because it is a long sleeve t-shirt and it has no additional features”. [Operational Manager]

Whereas, at AD, a Product Manager simulated a popular metaphor between ADs, “the soil in vineyard”, and he emphasized on the importance of facilities at AD in the city of Ourense for manufacturing Spanish made products. The R&D manager at AD provides one example of a situation to demonstrate how outsourcing could negatively impacts their revenues. He highlights despite a difference in total labour costs of £50 per calendar month for Chinese workers and £1700 for Spanish workers, productivity of the firm’s Spanish workers is higher that overall labour costs per unit of manufacturing production is £4 in Spain against £13 in China. For the manufactured products in Spain, the most advanced technologies are employed to combine the design innovations with quality materials to enhance texture, comfort and strength of the yarn fibre, extreme performance of fabric and chemical features. In particular, the nanotechnology has enhanced the innovative use of materials to complete the interactive relationship between the capacities of human tacit knowledge and technological systems.

The close relationship between AD designers and local Spanish manufacturers standardizes the transfer of supply chain tacit knowledge and as Ashby and Johnson (2002) highlight “there is a character hidden in a material ever before it has been made into a recognizable form... a sort of embedded personality, a shy one, not always visible or disguised” that can be learned from suppliers to contribute to a good design. Again, for that minor outsourced production to China, this R&D manager emphasized that expecting the Chinese to recognize ‘quality’ is the greatest supply chain challenge.

At the same time, AD Spain-centred supply network in Spain gave the impression to be less dispersed than Benetton and Debenhams, and my observations reveal it is more integrated. For AD, contrary to Benetton, rises of local costs does not make the company into a deep debt, as the high fashion brand is proud of leveraging its halo of fashion image to satisfy customers.¹⁵

Likewise, as proposed also in the literature (Audretsch *et al.*, 1996), the Spanish government is responsible to lead the creation of initiatives. To achieve the best results, each local cluster is allocated with a representative to cultivate the collaboration to ensure the involvement of actors from universities, private companies

¹⁵ Since the company ended the year 2011 with a debt of £29M (an increase of 27% over 2010) the company seeks to compensate the lost with market capitalization (Adolfo Dominguez, 2012).

and technology centres so knowledge spill-over is regulated between AD and other institutions.

Deep social relationships between AD and these actors have magnificent effect, facilitating disaggregated production and encouraging knowledge creation. Given the highly flexible divisions of labour between AD and Galician manufacturing clusters as well as the ad-hoc nature of technological advancement, trainings are learned on-the-job to produce specific skills. This is certainly the Nonaka's ideal situation as Thelen (2004) notes, the importance of sub-contracting relationships for production in clusters and labour turnover, the resulting knowledge creation capacities are manufacturing hub-based skills than AD-specific skills.

Hence, Adolfo Dominguez is advised to nourish its manufacturing competency by ICG fully computerized software, which has a centralized management system through web centric e-forms application that control the entire manufacturing operations in 10 different languages to facilitate the communications for the international partners. This unique application eases access to the database and facilitates knowledge access for supply chain partners to deal with each other:

“Supply chain knowledge is accessed throughout a corporate browser-based intranet, while numerical inputs are accessible for remote branches by the Intranet service”. [IT Manager]

So far, I have discussed the manufacturing process at this stage, as a tier, that the design begins to be materialized allowing access to the next tier. However, in essence it is much more unsystematic than this sequential procedure brought in here. A design can be produced from A to Z in very little time while the manufacturers reject many other ideas. Therefore, this standard procedure is fragile and it is rather difficult to breakdown the characteristics of each production line for the analysis of cause and effect on knowledge creation process.

5.3. Logistics

The Aftermath of Logistic Disarrangements at Debenhams

In fact because supply chain can only be juggled ‘knowledge driven’ and their work ‘knowledge-based’ as a result of certain key processes in the creation of knowledge, for designers and manufacturers who associate in the process, the

understanding of logistics people is extensively crucial. It is when manufacturers start to gain an understanding of the work of their logistics partners either it is outsourced to a third party or not to recognize the opportunities as such that knowledge creation move forward. Although at logistics tier a large part of the accuracy of operations is down to chance (e.g. strikes), delivering the products in the right location at the right time should be managed far in advance. A company who is able to strategically manage its social knowledge to learn from past practices and its technological capital to optimize the delivery routes are much more likely to succeed for a much more precise response to customers.

One of the most established concerns was logistics operation according to a number of managers I interviewed within Debenhams that have lived through the planning of global transportation. In terms of freight routes, from the time Debenhams' suppliers are mainly far from the UK, the company must use all road, air and sea freights for taking products from origins to the UK. Nonetheless, the logistics department tries not to encourage costly environmental unfriendly airfreight since the beginning of recession. When I investigated for more details, I found in the Europe, the road freight is the most applicable route for origins like Turkey, Portugal, Poland and Italy. The logic behind this selection is because the road freight and airfreight both takes seven days while airfreight is much more pricey. Then, from countries like Egypt, sea freight is used with 14 days lead-time and from India a lot of airfreight and then sea freight are the most likely routes. The Logistics Operations Manager here tried to show some knowledge socialization competency by introducing the Head of Buying as a great company for negotiating on kinds of product deliveries and sourcing: "I am dealing with intakes between distribution centres and buying department. So, we have to choose and co-ordinate all that processes and also prevent challenges...this can impacted by vassal delays or port closure because of high winds..."

Stocks come to Southampton and Flixton ports in the UK. However, due to the frequency of storms and winds, Flixton is closed regularly and delay is expected. Airfreights come to Heathrow and Stanstead airports in London when the import team begins planning for the arrivals and the team ensures customs entry are being filed correctly and space is made available in the distribution centres (DCs).

Essentially, this means returning as something closer to emerging problem solving capacity of individual status in most of the structures, rather than as a

determination of established relationships between two separate bodies of a supply chain. However, in order to recover from this downwards turn in the conversion of tacit-explicit in externalization to explicit-tacit knowledge in internalization before reinforcing combination mode in the process, the Logistics Operations Manager attempted to persevere a methodical approach toward managing carriers by a programme called REX:

“All we want is raised in that [REX] basically. And obviously, any reporting comes off that and it gives the visibility to see what has been raised. That information is downloaded into BtoB [business to business] profile which then allows suppliers and carriers see that. So, booking is made in there. Then, carriers confirm that it is matched and all approves in that way. Also, duty information and customs can be found as well for preparing any reports to the management team”. [Logistics Operations Manager]

Besides making sure that the logistics partners are supplied with legal bonds seeing that as contractual obligations composed of a collection of documents to clarify the strengths, no sign of critical recognition of knowledge combination was found there. The question is how this piece of programme contributes to synthesize more complex explicit knowledge from sources of explicit knowledge when there is no opportunity for collaborative analysis and prototyping. Instead, this sounds to me the combination of existing organizational creative methods, techniques and previous knowledge results in informative programme to feed inter-organizationally. Again when asked for alternative methods, this dip, was redirected toward socialization process: “everything is much better to be face to face but time restriction because we work apart. So, we spend lots of time on the phone or emailing. Sometimes, if possible, we ask for 10 minutes walk over...that’s the best way to deal with it.”

Empirically, the difficulty is not when the logistics team first starts achieving some measure of operations but sustaining it, there is a need to constantly expand the potential DC managers in order to keep going connected and this requires ever-higher levels of knowledge transfer which may not be realistic with current strategies at Debenhams. In other words, for Debenhams, the lack of visibility in controlling global operations in case of unexpected incidents is transparent. It contrasts greatly with cases at Benetton and AD which decisions are more systematic and generic

rather than personal.

While, 'Agility', the logistics provider, facilitates Debenhams by providing tracks on international operations, local knowledge, and customized resources, a Logistics Manager at Debenhams with 15 years of experience accepted that his position is the important factor to the company as the changes he made led the company be what it is. He explained how he makes sure that the right product is loaded in the right container and gave me an example of his contribution to the logistics performance by stating that:

"...the bestseller stocks to be in one container..., when there is at least 58 cubic meters in that container... and... the supply chain manager only wants men's wear in that one and no children's wear as children's wear may not be bought as much as men's wear". [Logistics Manager]

His emphasized on "the supply chain manager wants", clearly demonstrates how personal experience involved in knowledge creation instead of an analytical tool that enables detailing the management of logistics by measuring profitability, acquisition, retention, satisfaction, lifecycle or loyalty of freight forwarders so knowledge can be combined with less miscalculations. In another expression to load a container, a Carriers Manager emphasized on a kind of matrix which seems not enough as a source to solve utilization problem for a multinational company with billion pounds of cash flow:

"...you have X amount of stock. You have to plan X amount of containers. In order to that you have have some sort of matrix. There is a table, which tells you X amount of garments equals to X amount of containers. It's a quick fix. It's a little table tells you that's fits in that and basically what we did what redo this matrix. Interpretation was a big factor in there. The matrix was based on garment measurements. If the garment was this length it equals that amount. Also, it's more based on product type rather than product measurement. In another words, T-shirt equals to X. So, we put a lot of working into that. Then, we came up with our matrix that we, obviously need to share it with our carriers. They say ok. Listen! I'll help consolidate your loads into nice packages. So, you cannot not only ship in your containers but if you got a

production run going instead of making me 2000 this week 2000 next week, make me 4000. It will save you cost. It will save me cost”.
[Career Manager]

Seeing the fact that the Debenhams’s complex network may causes error, I asked a Logistic Manager, what if in the case of arrival an error occurs. He replied: when “all the DC is filled?” I affirmed that. Then, he mentioned that there would be still 10 containers ready to be filled; the import team investigates that those 10 containers have not got any of priorities. Then, those containers are the priority in the next following week. These responses all emphasized that, although complication of operations leads Debenhams to solicit a third party logistics provider to overtake the logistics but since they are able-bodied in making manual connection, internal managers in charge of logistics and freight forwarders are well experienced.

Visualization of Operations in Benetton and AD Logistics Frontlines

Since Debenhams’s reliance on converting tacit knowledge seems to fail to fully acknowledge the explicit knowledge creation and therefore the combination mode, the movement of required knowledge in brain-to-brain form is surpassed by the level of mechanization at Benetton and AD. As stated by a Carrier Manager at Debenhams, at best the conversion of explicit knowledge leads them to use the spreadsheets to answer necessary questions, which to me sounds an inefficient method for optimizing replenishment complexity:

“Debenhams is a very Excel-driven company. So, I give an order book and every order by buying department is onto that order book. Now, what I do is going to the order book to download what the shipping is for the next 6 weeks then doing the historic calculation based on what department it is for”. [Carrier Manager]

Here learning from the quantitative data is necessary to “annually reduce the distance between the optimized results and the current practices”. This direction, ‘roadmap’ is given by means of new ways of utilizing business models and shipping data. Then the challenges brought to managerial meetings to enrich the combined knowledge before internalizing this to front line employees.

For Benetton, almost half of the sales shipped by air to 7000 stores with an eight day order cycle globally. When I asked for some details as it contrasts the earlier

fact given by Debenhams' interviewee regarding issues like time and costs, a Benetton Logistics Manager indicated that cost of airfreight is not as important as the savings in inventory. The importance of standardized inventory management led the company to invest hugely on its logistics system to feed the DCs highly mechanized without human intervention (Plussort): "To the largest extent possible, logistics processes are computerized". The evidence shows that by great investment on automation and modeling tools the entire logistics network, Benlog (Benetton's Logistics Agency) delivers 2,500,000 items/week to store.

For instance, products are filled in pre-sized boxes, bar-coded and labelled by the name of the destination. For Benetton, since 20% of orders are manufactured by quick response method and 80% planned for capacity maximization, time advantages in logistics stage are considerable again. Furthermore, since local plants mostly complete the manufacturing operations, it does not sound complicated to manage the logistics of the minority products which are sent to Hong Kong (Asian cluster) to be transported to the Benetton's global store network. The automated clusters are equipped with satellite system for receiving delivered products from manufacturing clusters in Castrette for dispatching the products through a long tunnel to the automated DC.

For international destinations, Benetton works with a partner to manage global forwarding. Products are also cleared by EDI technology to externalize all necessary knowledge from individuals who deal with the process before the arrival of products. When I raised a question about the profitability of using EDI, besides receiving positive verbal comments approximating its impact on 'just in time', 'quick response logistics chain', 'sales monitoring' and 'replenishment management', I have been given a chart, which shows more than 50% reduction in products distribution errors had occurred since the company implemented the technology. At the same time, the performance is shown to have an improvement in lead times, for instance for the products to the US market, to almost two weeks. Thus, as higher level of complexity of environment leads to complexity of logistics, uncertainty rises unless barely socialization activities move toward more complicated knowledge conversion processes where technology can supports time and accuracy.

Comparable to the descriptions of Benetton, AD has trade compliance, knowledge systems tools are applied for the planning of transportation, warehousing and packaging, consists in providing the right knowledge of managing order. For AD,

logistics is a competitive advantage owing to the fact that manufacturers are based nearby. By tying its logistics systems in and employing an agent which handle the logistics by implementing business continuity plans, AD achieves the best cycle times between these cases and perceived customer service levels as in the case of unexpected circumstances performance leave reliable. The privilege of AD in this case is 'the management of events' which helps the staffs to intercept irregularities and complex situations before they may prevent efficiencies. The event management system automatically sends a notification when time KPI as set by management team is crossed. While for expensive and detailed AD products accuracy has the highest value, specifically, seeing Benetton as a fast fashion brand where product life cycles are planned to be short to cope with customers' short interest, time plays an important role.

In actuality, Benetton manages for eight collections in addition to two basic fashion seasons. In this case, AD stands by Benetton for managing logistics operations where the main difference is EDI in AD case relied on networks, consisting of AD as the dominant partner surrounded by suppliers and customers. In addition, for Benetton the agreement on contents and format of exchanged data are more collaborative while for AD it is more informative with less opportunity for business partners to engage in knowledge creation process. Regardless of differences, in my opinion, although Debenhams defends themselves with its cost cutting strategies but, AD and Benetton retain knowledge creation competency by carefully tracking and reacting to demand. Having EDI in place, supply chain is integrated to CAD/CAM systems to link manufacturing to demand and demand to design accordingly. Then these capabilities (e.g. CAD) as stated by Blackburn (1991), help the teams to make the pattern, provide accuracy of measurements, shorten lead-time and enable electronic storage of the transmissions.

This is in great contrast to Debenhams which according to the words of its employees what happens is each division needs to forecast of import in half of the financial year from week one to week 26 and they provide that to logistics manager and he knows what flow he needs to do based on his experience. He surely knows divisions cannot always get all their required stock at once while if they are personally asked, they will say their stock is very important but how systematically they need to be shown the importance of their stock should be calculated versus the

importance of everyone else's stock. The difficulty of this task when should be claimed by personal experience become more difficult:

“...suppliers are 5 weeks late and it's t-shirt and the weather is becoming colder and colder. So we need to put it in as soon as we can. So, there is a lot of different factors are in there”. [Logistics Operations Manager]

In order to do this, certain resources are vital including technological skills, problem solving programmes and optimization strategies to plan deliveries from a manufacturer to a DC each day. Having a well-developed self-concept is also discussed to be essential, to manage knowledge regarding the orders, trucks, and roads. It may be of interest then for supply chain managers to provide within their development programmes, more emphasis of social priorities to be sensitive to both implemented and unimplemented scenarios for sharing the results within teams. Hence, the capacity to evaluate and act on options in multi-layer relationships can not be undertaken manually since is not only too time consuming but also too error prone to support global supply chain knowledge creation.

5.4. Distribution

Debenhams-DHL Partnership for Managing DCs

This part specifically focused on the relationships with distributors that also underlie the specifications of DCs to stock products before sending them to retailers or directly to consumers. These centres are the foundation of supply networks and therefore how knowledge creation process emerges within their activities following on from the manufacturing tier. Distribution, which is the last tier to be explained in this chapter, puts the knowledge creation process at Debenhams in a winning position at some points. To give a background, in total, Debenhams owns six DCs in the UK, which are located based on the store demographics and the specification of the products. They are also geographically segmented to serve the stores. For instance, two DCs are in Northampton for supporting the southern stores and one is in Log farm for hanging garments. The other one is in Black Mils containing a mixture of small accessories and hanging garments and the international, Internet distribution, all of the big box products such as home products and some of accessories are in a 750000 square feet DC in Peterborough. Finally, the newest one has just opened few

months before I began my research in Sherbon, Leeds with 700000 square feet capacity to support the Northern stores with some hanging and some boxed fashion products.

While Debenhams owns these DCs, the management of operations is outsourced to DHL. DHL manages essential services from warehouse and distribution to the almost 157 stores across the UK and Ireland. These services include supplier collections, store deliveries and returns processing. In more details, the Head of Logistics explained:

“One of the other key changes in recent years has been the evaluation of an advance warehouse solution that now better allows DHL to focus its resources on moving Debenhams high priority product lines more swiftly through the SC”. [Head of Logistics]

According to the available documents, since 120 million Debenhams products such as fashion, beauty, and jewellery are managed by DHL staffs, DHL has a vital role in receiving and checking the containers, checking the seal, off loading them, and counting the contents. Drivers must sign off the receipt for DHL people to guarantee there is no damage. While the deliveries of products are processed, the system updates inform any changes to distributors and the merchandisers. A big part of the products go straight away to Oxford Street, Liverpool, Manchester and the rest of flagship stores whereas some of them go to international stores.

DHL scans the stock in and do the allocation, put them out into the stores, vehicle deliveries and begin the distribution process. The distribution process depends on the size of the stores, frequency and delivery. As an example, Oxford Street, a big store, is rated five in frequency since it has five deliveries a day. Southern stores also have two deliveries a week on Thursdays and Tuesdays. Here, DHL optimizes the transport routes and what Debenhams supply chain teams add is the efficiencies that obviously if drivers go to South End Lakeside store, Chelmsford store is close by. Therefore, The distribution teams make sure that the vehicle supplies both of them.

By this contract, DHL provides extra knowledge for Debenhams by allowing its human resources share organizational tacit knowledge gained by many years working experience in interaction with tens of retailers other than Debenhams to Debenhams. Since staffs share overlapping knowledge, they feel what others are trying to express. In this situation, DHL members enter Debenhams operational

knowledge and allow Debenhams to create new knowledge with one of its supply chain partners, which accidentally is a part of other competitors' supply chain. This supply chain knowledge creation followed by emigration of DHL expertise with a focus on demand applications. In this context, one of managers related to DHL operations stated that:

“They (DHL) have access to our Intranet. They are all in confidentiality agreement. But, we don't give information about one supplier to another supplier. But our relationship with our strategic suppliers is absolutely critical”. [Operations Manager]

According to him, Knowledge from external divisions is brought in, by moving in members from suppliers and the linking of knowledge in the intranet 'Knowledge Hyperlinking'. As a result, the company is not in a strict shape but rather fleeting and through the continuous socialization in and out of the company. It demonstrates the dynamic nature of knowledge creation and the diversification of ways in which it is co-created through the SECI process, highlighting the importance of partnerships. It originates in a mutual relationship and its roots have been found from the knowledge residing in individuals who are not employed by the company. Here, knowledge creation seeks to smooth the progress of communication between individuals and the organization around the partnership innovation. In some cases interviewees at Benetton and AD thought that with asking their distributors regarding their knowledge of their operations they realize what they know but companies have to distinguish the difference between what these contractors express and what they truly know.

Incongruent IT-Oriented Systems for Managing Deliveries at Debenhams

In addition to socialization and externalization of knowledge, while the human capability handle the operations; Debenhams utilizes electronic communication by means of B2B technologies as a key for converting tacit knowledge to explicit knowledge. However, in order to tackle combination of knowledge, Debenhams employs net-based applications to source by developing products and improving stock movement. The company puts a large-scale project, a private B2B portal, into practice to be in visible touch with its 1300 contractors worldwide. This portal is a multiple tier environment based on Microsoft.net and designed by an external software

developer to cover global suppliers for order management since few years ago. Here, order management automates the management and approval of production and purchase orders. In particular, it helps for delivering orders and tracking information flow; managing the shipping noticed sent by suppliers and third parties as well as allowing the company to observe accepted or rejected products or products in logistics pipeline. Practically, if a host is a concession, or if one of the designers at suppliers, so the likes of Jasper Conran or John Rocha, suppliers internalize knowledge which are shaped as sales reports.

Therefore, there is a contract with designers that confirms they get a percentage of sales through the B2B portal. Since then, the portal is quite important in terms of communicating with suppliers, and according to the Business System Controller at Debenhams; "...each year we keep adding on a little bit more information onto there so that it becomes their way of dealing with us". A Operations Manager explained:

"It has purchasing and ordering module. It has a logistics module where all my carriers manifest the products. We have a dispatch authority module, which tells everyone what has got permission to ship, what hasn't got permission. We also have a finance module to see the payment invoices and international module, which is the way to be in touch with our international partners. Also we have Info web where we keep our supplier manuals and where we update suppliers' general information".
[Operations Manager]

Here, in this exceptional case, which the use of technological support is found substantial for the operations to serve Debenhams supply chain knowledge creation, the software is not fully employed. This manager believed the software does not have an adequate amount of flexibility to add or delete elements:

"They helped us in the first instance to develop some of the functionalities and the design of the initial screens. Now only part of that platform is still in [original] language other elements like finance uses other tools. Many things are in there but it is hard coded. We like a little bit more flexibility like move something from here to there or add a new screen". [Operations Manager]

This description is very noticeable, as the manager expressed his company is unable to decode the tool, which was bought in supposed to facilitate the operations. In another expression an IT manager shows the lack of enthusiasm of his company to manage the process just to cut little more costs:

“... with any piece of software we buy from anybody external, whether it's CODA or this Service Infrastructure, you have to pay maintenance, usually 15%-20% of the costs, but if you write it yourself, you don't have to. So that's why we might want to change some of those things. So that's that”. [IT Manager]

In other words, combination of knowledge is superficial either by staff which are not able to work with the tool to prove that the culture of Debenhams is not well established for global competition or the management decision making is poor as the decision making for the investment has been mistakenly made on an inappropriate tool. This situation is inconsistency with Zylstra's (2006) explanation that the driving principle behind distribution is the use of IT-based pull (Kanban) to simplify processes and minimize total costs across the operations.

Likewise the use of Global Data Synchronization (GDS) tool is a problem at Debenhams. This catalogue is supposed to relieve Debenhams for synchronizing product information with over 100 million unique items, as well as to create a cyber context for quality communications with all trading partners globally in a reduced cycle time. However, according to an IT manager at Debenhams, GDS initiatives supply chain requirements to specifically work with other supply chain programmes such as Radio-frequency Identification (RFID) and Vendor-managed Inventory (VMI) for boosting the implementation:

“With this catalogue we try to work more effectively and accurately by synchronizing product information and ultimately drive increased sales and reduce time-to-market”. [IT Manager]

Again, since this agreement had not been signed yet, there is still no RFID system in place at Debenhams while Benetton and AD make the most of it for accelerating the transformation of knowledge while tags are adapted for controlling the process treatment for fabrics finishing (e.g. washing). Here, RFID could be used for garments identification, which are transported within and between suppliers,

warehouses and finally stores. Major information about each fabric can be available to be read and interpreted by individuals or contactless can be sent to the knowledge warehouses. According to a manager in IT Department:

“... we did think about doing some tests with it (RFID) a few years ago but the costs were just too high and we think the costs are just still too high. We haven’t looked at it for a few years now and I think that’s because the list of projects that the business has for us to do is quite vast and their view is the return on investment is better with projects ... increase sales and reduce costs. RFID isn’t really in there. Most of what we’ve done in the last two years has been around getting the websites up and running. So the growth of the website has been vast whereas the growth at stores or anything else or things that we think we can get out of supply chain efficiency aren’t as big. That focus may well change depending on Debenhams’ long-term strategy”. [IT Manager]

This comment is an indication of how little the management team spent on systemizing the operation to diminish the complexities. It is believed that RFID is not industry-standard yet. In the IT manager’s words:

“Especially if we do business with any other international companies... then the supply chain comes back into focus and then moving stock between countries and splitting stock at the supply end”. [IT Manager]

While franchise partners are not linked to the international stores, the explanation of ignoring knowledge management model, in this case the use of RFID in combination mode, mainly comes from the fact that companies like Benetton are able to consolidate products into a warehouse in Hong Kong and ship them to the ultimate destinations. In comparison to Benetton, for Debenhams, products returns back to the UK and stores in the local DCs before being sent to the global stores. Nevertheless, flowing stock through the supply chain may cost enormously that the RFID has to be the case for splitting stock and moving it around the place and order.

The last indication of poor IT management at Debenhams was observed in the food services. A system clash occurs regularly when supporting the entire clothes financial operations with Payroll as well as Point of Sale systems (PoS) hosted by IBM. In spite of the fact that the investment on IT indicates a step toward

mechanization of the operations, since these two software were written in different computer languages to control two distinctive operations, the IT team decides to stop offering foods from the DCs to the franchise partners. Not having the right technological capital in place, the data is not generated smoothly, information disallowed to be directed and rarely knowledge created from the franchise partners to be used for increasing profit in the food market. While one software deals with food, there is a number of applications in terms of tracking foods short product life, the other deals with general merchandise, there are a number of offers in general merchandise, some of the sales which are more complex than in the food area whether in Debenhams or other supermarket operators like John Lewis, Waitrose.

Automating DCs for Compatible Results at Benetton and AD

As discussed Debenhams facilitates the flexibility of human intelligence as a superiority to handle knowledge creation process while supplementary computerized systems do not seem to be involved as much. This is while for Benetton, beside two international DCs in Shenzhen and Mexico City; there is a central 30,000 square meter fully robotical DC in Castrette, which receives products in lower ground floor for controlling the quality of deliveries before dispatching them to the sales networks. This is an extra care to match data with current global market trends where products will be sent to and to match multi-local exchange of best practices for domestic consumption as an opportunity to exploit knowledge application just before dispatching boxes to storerooms.

Since the initial packing is already completed, mechanized conveyors that are equipped with electromagnetic sorting system deliver the boxes in the storerooms. The minimum capacity of each conveyor is two dozens of boxes to be allocated in shelves. The storerooms have capacity of 250,000 boxes while the DC contains 12,000 boxes every day composed of 120,000 packages daily and 60 million products annually. This structure ensures the integration of the supply chain cycle by managing the orders, packaging and deliveries for the Benetton stores globally. These advanced facilities give access to certain products as well as make them fully identifiable by staffs and computers in the supply side and by final customer in the demand side.

In contrast to Debenhams, which employs over 50 staffs to control the process in its more traditional operating DC, in view of the fact that the bar-code reading is mechanical to scan thoroughly, only 28 people is controlling the operations in a time

to lessen the faults of human intervention at Benetton. Interestingly, those staffs that monitor the operations are there to not make any changes but to:

“...bring their best practices to any kind of relationship we have got. So, in terms of freight orders we use. One will look after the cargo from Asia and one from European countries. If we look after the one responsible for Europeans, they also do a lot for Zara and other large retailers. So, what we always ask them to do is if we come up with something”. [Distribution Manager]

In addition, technologies such as RFID help Benetton to gain fair visibility over distributed products with the emphasis on the sold products. Here, with combining knowledge via an integrated system provides access to the required information in preference to relying on the spread sheet reports for individuals. As with the great importance of RFID to create knowledge, for instance, one form of tags is included into the product label and it is built on product substrates, while the second form of tags is stuck on plastic substrates. Both tag forms are well-matched for garment productions to be transported. Likewise, RFID can read further information on the tag as might be required for quality insurance investigations and ethical improvements.

The situation at AD is greatly similar to Benetton and contrasting with that at Debenhams. All the boxes in the DC are labeled for RFID-embedded shipping, allowing employees to enter the new merchandise into the store's inventory using handheld devices. What's more here is the use of order picking technology which in addition to radio frequency handheld tools visual radio frequency scanning technologies lessen complexity of bad sourcing in three ways:

“By employing this technology, three kinds of errors by human resources can be eliminated: the first is erroneous removal of items from the order list while the item is already in stock. The second error is sending the wrong items to stores, which occurs when human resources are placed in wrong locations/positions, or are present in locations where dissimilar items are stocked. And the last error is the incorrect counting of the sent items”. [IT Manager]

Probably this is an answer to Benetton, which by implementing an extensive

number of software systems still lack of visibility exists in a number of ways. For instance, although, Benetton successfully applies franchising system to its business that allows high-speed growth thank to the use of local financial resources but RFID tool does not fully applicable in franchise relationships from the time when the departments such as regional inventory, is not able to link local DCs accounting portals for those who work under franchise scheme.

The outcome of a Chief Procurement Officers (CPOs) survey in 2008 is in line with the findings at Benetton and it has shown that 50% of CPOs view improve the spend visibility and availability of the product as a major issue to be resolved. This is while, in 2007, only 10% of CPOs has shared this view. Abery *et al.* (2008) add, “this is not because organizations are not investing in technology.

Indeed, a paradox has emerged that as IT investment rises, the quality of the resulting knowledge is seemingly becoming worse.” Therefore, technology cannot assure supply chain requirements. Although, information systems can help to have quick access to the demand knowledge but they cannot necessarily provide the required knowledge that is needed to surpass customer expectations.

Although this piece of evidence seems to indicate that franchise relationship is a tragedy for managing knowledge creation at Benetton, but since all of the cases relatively face with similar issue, it does not contradict the earlier findings that Debenhams is extremely weaker at managing IT for knowledge creation. Nevertheless, in contrast to Debenhams, since only AD’s DC contains AD unique products; the problem of tag fulfilment from different suppliers is evaded. However, the great advantage of AD in managing distribution is regarding the chance in using facilities in its manufacturing clusters.

Below, based on the comparative analysis as stated above, the main contributors in processing knowledge creation at downstream side of supply chain are identified and summarised:

Table 12. The comparison of the recognition of knowledge creation process at downstream side

	Debenhams	Benetton	Adolfo Dominguez
Main designers	Co-design with suppliers	Agents	In-house designers
Manufacturing activities	Low cost suppliers mainly in Asia and the Far East	Subcontractors mainly in European production hubs	Skilled suppliers mainly in Europe
Manufacturing strategy	Availability of products	Quick response	High quality
Logistics routes	Scattered	Concentrated	Concentrated
Distribution rationale	Externally managed by DHL	Internally designed and managed	Internally designed and managed

5.5. Conclusion

Both this chapter and Chapter four have attempted to explain the knowledge creation process that structures the conversion of types of knowledge into each other and how knowledge sources are employed within it. The examination of social resources for the fashion supply chain allows us to probe into the humanistic effect, which is at the heart of conversion of tacit-tacit knowledge and tacit-explicit knowledge versus technological resources, which balances the outcome of social relationships into knowledge management systems. In more detail, social resources characterize the knowledge inherent in employees and managers, as they are related to the task at hand (Dess and Picken, 1999). However, since in studying human capital it is not considered as a property of the organization (it is individual-based, owned by people who create a considerable added value, and not easy to replace), technology must support to sustain this intangible asset.

As it noted in the previous chapter, individual creativity is a characteristic, which helps convert tacit knowledge to explicit knowledge and move socialization to externalisation. This is important not only in organization's vertical relationships, but also its supply chain formation.

For instance, it is important to consider the fashion designers as initializers in the downstream supply chain with, where their applied methodologies to highlight

tacit knowledge embodied in their designs play a direct role in the manufacturing process. In the second tier, nevertheless, as clearly analysed in chapter four, in order to implement supply chain knowledge creation, the power of manufacturers to produce and share explicit knowledge are crucial to link the unique design ideas into computer aided programmes to achieve the best results so that SECI process could best be framed using the wider principles in order to be made comprehensible not this time at organizational but supply chain level. Thus, here the company will be considered expert in the initiation of the supply chain knowledge spiral if the practical synthesis includes tacit knowledge and explicit knowledge, at various levels (individual, group, organizational and inter-organizational) and across departments, divisions and inter-departmental projects and layers (top-management, middle manager, store manager) within supply chain.

This means that knowledge creation needs to be synchronized in a way that influences partners of supply chain. The fashion supply chain, on the sense of the field of producing consumer goods in general therefore seizes dynamic dialogues of common interests for considering knowledge creation to facilitate their operations against supply chain complexities that as we will study can be global. Therefore I begin to analyse the supply chain from downstream information flows as a new framework on which larger social and technological forces have direct impacts. This outline depends upon calling design, manufacturing, logistics and distribution stages and their nature of operations which for instance explain the operations in design; deciding what is to be designed and what is not, both how these decisions are made, what complexities could threat and what resources are available to resolve/prevent.

As such knowledge is shown to be created in a variety of ways both tacit and explicit for inherent accessibility. More specifically, this chapter has also argued that supply chain is currently experiencing a shift towards globalization for cost-driven supply chains, which reinforces the need for managers to be expert enough for actively managing their relationships. As it is presented in chapter 2, the gap in the literature describes three capabilities, namely knowledge creation, supply chain management and fashion strategy, which are rarely studied together.

How these resources are used to navigate the supply chain knowledge creation to the retail level is the focus of the next chapter where customer knowledge will be used to unpick the demand side; both highlighting the inherent knowledge that store

personnel need to acquire in attracting their customers and also transferring it to the relevant actors.

6. Upstream Knowledge Creation

After examination of inter-organizational knowledge creation in Chapter four and downstream knowledge creation in Chapter five, it is time to concentrate on the last component of supply chain knowledge creation, upstream knowledge creation. The question is whether knowledge management practices are present at this stage, so that the results of these practices can be used for customer management. Although we have covered in the literature that there have been some studies exploring the relationships between customers and knowledge (Baker, 2000), and customer knowledge in the fashion market such as choices of adding or removing product features (Paquette, 2008), there is very little research focusing on relationship between knowledge creation process and customers as a tier of supply chain. These relationships are touched on in the literature on the support process, especially in context of retailing for accumulating resources as part of studying supply chain knowledge creation.

This chapter will focus on how these companies as a whole and their employees, who deal with customers, comprehend complexities upstream in the supply chain. My findings are compatible with Whitford *et al.* (2005) and Vidal's (2007) descriptions, the innovative potential of interacting with customer needs clear social institutions in business-to-customer relationships whereas guiding suppliers fall into business-to-business relationships when particular elements of comprehensive staffing strategy are involved in knowledge creation process. In other words, as a result of the formal approach, such as using knowledge systems to pay for evaluating the manufacturing performance applied to collective knowledge of supplier companies (Kogut-Zander, 1992 and Spender, 1996), customer knowledge can be achieved through seeking for individual knowledge (i.e. tacit knowledge) (Grant, 1996 and Liebeskind, 1996) more rigorously. This is why the accumulation of knowledge, as proposed by this thesis, is required for studying supply chain knowledge creation.

6.1. The Creation of Global Identity for Debenhams

With a glance at the differences between business strategies, as noted before, as Debenhams tries to expand its business outside the borders of the UK, concurrently, it strives to expand its international partnerships slowly and steadily so

that the so-called franchise partnership can reduce its financial obligations and instead increase its product sales promise. This internationalization of market is gradual for Debenhams while the basis of profitability at Benetton and AD relies on franchising. Therefore, considering customer knowledge creation, understanding customers that are hindered by an intermediary (i.e. franchisee) will be subject of controversy. According to Sanchez (2004), in international franchising, where franchisor and franchisee distinctly operate, a more knowledge-intensive relationship has become a must. In other words, the greater the knowledge in common between international partners, the better that knowledge can be put to valuable use (De Clercq and Sapienza, 2005) during the start-up stage and can continue once the business is established. Harmon and Griffiths (2008) support this view and argue that both franchisor and franchisee are reliant on supplying customer needs.

Although some marketing authors believe in cultural adoption as also expressed by one interviewee twice:

“In this country, people like to wear same colours or colours, which look good together but in France young generation, has another way of thinking. They tend to wear contrasts to look cool.
... in big cities people wear colourful shirts but in smaller towns people tend to wear dark shirts mostly”. [Merchandiser at Benetton]

But is it not the onset of anarchy in supply chain relationship, especially as discussed in the previous two chapters that Benetton and AD exercise pull supply chain systems? It is only possible to acknowledge their customer knowledge creation in relation to supply knowledge creation as strong when extensive evidence for franchisee's high knowledge creation capacity exists. While we will see that in many instances, this will not be the case.

Since Debenhams greatly denies franchise business format and applies direct business strategy, the stirring of explicit knowledge could be the challenge to assure the visibility of demand changes as followed in the conversion of explicit knowledge from the time complexity of selling to global customers increased compared to their limited supply system for domestic consumers. Here, a generic strategy toward capturing and sharing knowledge has to be implemented intensively to guarantee sensitivity to global demand changes for new product development or repeat orders. This case stands for Debenhams while for Benetton and AD, franchise format should

be coupled with responsible social resources that are trained to the company's minimum standards to competently receive accurate consumer-base customer intelligence and link that knowledge to the central systems for the utilization of knowledge regarding preferences in various contexts.

While Debenhams in London remains the centre for general R&D projects, research centres have now also been established in joint activities with international customers thanks to the work of small size marketing research firms. The information is bought from these agencies. However, the employment of agencies is still negligible when comparing to those that work for AD. But the customer panels of 15,000 shoppers that is called the 'Design Team' works in partnership with the market research agencies to share the agency's software for analysing surveys. These R&D activities support the international team to couple gathered results from stores in sample locations to perform deeper customer analysis. For instance, for international expansion, those agents who were sent over from UK spent a considerable amount of time networking with local staff in the new environment in Indonesia for opening up two stores in Jakarta and Karawachi. According to the Head of International Operations, they were responsible for managing

“...new department store formats in emerging markets, developing customers' attitude to a new brand and training all that team”. [Head of International Operations]

Since the control is direct, the rotation of staff is carefully considered to assure the use of socialization of knowledge from Indonesia to the HQ in London and vice-versa. Staffs act as human knowledge workers between UK and international stores. They might side with overseas market activities to learn from their experience and integrate particular knowledge which is then directly affecting the marketing strategies later (e.g. the Islamisation of merchandising). For instance, if customers are questioned, to decide on a home project, what quality message is most appealing to them? Was it supremely soft cotton? Was it Egyptian cotton? Was it 250-thread count? Then it is possible to create a pivot table of that data looking at the proportion of customers that like each of those quality messages. This could be cut by gender, age or loyal Debenhams shoppers versus infrequent Debenhams customers for further investigations. Then based on that, merchandising team set demanding targets for the products initiating visibility, promotions, pricing, packaging and special offers.

New store opening requires not only knowledge resources for experimenting and observations, but also a high level of interaction between many knowledge providers, from departments including International, Marketing, Finance and Design engaged in a range of steps. New requirements in relation with suppliers are necessary as the new location requires a new logistics route, if not a new distribution centre. According to the Head of International, from the admittance of a project to the time a new store started working is a year, minimum, when sources of knowledge are required for risk identification and assessments. The identified solution is 'Project and Portfolio Manager' (PPM) and 'project-scheduling tool'. This software includes updates of HR systems, the development of order fulfilment applications, and to track future projects by forecasting supply needs up to 14 months ahead of implementation phase.

Apart from fundamental rotation, that empowers the company's insight into the tacit knowledge. The strategy is reviewed and updated on a regular basis. This helps employees to change with business development and promotions. Although the host market might never pay these development investments back, the customer knowledge that is now created by using sub-brands to target specific segments of its markets is networked crosswise to nourish future strategies. This process closely resembles the procession of customer knowledge described by Rowley (2002) and as a result, Debenhams has taken the lead of Marks and Spencer's in global expansion programmes in this Indonesian project.¹⁶

Another significant example of socialization here happened during my observation at HQ when the US was confirmed as a new global market as well. According to the Head of International, first, there were three nominees for the opening of the first store in the States. The cities were in communication with Debenhams on a daily basis. Afterwards, by reviewing the economical feedback heard from focused groups as well as past online regional transactions, 'Geographical Data Analysis' combined the results from distribution of customers geographically. While statistics show that the highest total revenue achieved in the UK was in close proximity to Debenhams stores, the highest online shopping came into account since there were no Debenhams stores and services before in the US. Subsequently, the

¹⁶ In 2012, Debenhams won the best global retail expansion award at MAPIC over the confirmation of planning to open 150 stores internationally in the next five years.

final decision was made in favour of opening the first store in Chicago based on the surveys, which categorize branches based on the variations between general and public ratings. This process seems an advantage for Debenhams to not follow the unsuccessful stories of its popular European competitors, i.e. Next, Mark and Spencer's, and French Connections who all failed in expanding their business to the US, for the most part, due to the lack of understanding of product ranging and sizing across the ocean (Jackson, 2007).

As soon as the new store is opened, to quicken the process within upstream chain, the HQ pursues its store managers and customers for scheduled meetings. Here, knowledge networks are created and individual knowledge easily accessible. For this purpose, the management team initiated a 'mind shower' slogan to show the significance of these meetings and the fact that they always should strive to identify staff with past experience. In these meetings, the team asks pre-arranged questions from each other to hit product and service improvements from their direct and indirect observations of customer behaviour "why is that garment hanged with plastic bags?" These meetings serve to create a consensual concurrence among the attended actors of what will become the most innovative ideas to reduce the inefficiencies as well as increasing compatibility on the customer side? Finally, the results of these meetings are sent to the trend forecasting companies for further analysis.

6.2. The Improvement of Global Identity for Benetton and AD

While for Debenhams direct contact with customers has been the main strategy to attain knowledge, it allows them to continually be decent at identifying market segments for developing more accurate demand forecasts. However, according to the majority of interviewees from Benetton and AD, franchising system has been widely applied to permit a fast growth of sales and an ability to nourish the business creativity in their opinion, and short-term revenues in my opinion.

For instance, in the case of Benetton, one interviewee claimed that the profit of Indian shops rose 45% when the company replaced the owned-stores with franchise partnerships. This clearly demonstrates the fact that the company might be able to rise revenue in short term but knowledge initiation in franchisor-franchisee relationship would be slowed down. In franchise system, the value adaptation is relatively slow-paced as theorized by Mantrala *et al.* (2009). Financial arrangements, for instance in London, Benetton products are priced moderately, while in the Middle East they are

priced as high fashion items which gives different impressions on the ground of price value. Nevertheless, value is not equal to price arrangements but it is the total experience and the benefits received from purchasing products including store merchandising, sales service, convenience shopping experience and quality service (Berry *et al.*, 1994). It entails that not all customers are price sensitive; some of them could pay a lot more to when a favourable overall shopping can be experienced.

From my visits in the Benetton and AD stores, since the direct socialization meetings were seen insufficient, I came to the point that customers entering a Benetton owned store in Oxford Street in London and a franchise store would find themselves in two different experiences. Despite the fact that the stores were all for the most part green and modern, the customers' experience is dissimilar mainly on the grounds that staff appearances, merchandise displays, floor spaces and trainings are different. Contrasting regional practices with HQ knowledge management strategies, one franchise partner at Benetton was self-aware of this dramatic knowledge gap and stated:

“Our company does not have employees with sufficient knowledge. At best, it has experienced employees but what we know is based on the experience we have. There is no sign of knowledge. If we had knowledge we would have been able to make use of our experience better and more productive”. [Franchise Partner]

This response seems to indicate that it would be a better relationship if the franchise partner had a chance to learn from HQ to make sure that their practices are not limited to their own long-established traditional knowledge management. In addition, the continuous improvement which is fostered by human resource practices lose tacit and explicit knowledge on the stores while it should be possessed primarily by front-line staff who are in direct relationship with the retailing source of knowledge (Vidal, 2007).

For AD, the franchise partnership is less damaging. The conversion of tacit knowledge seeing that the socialization gap between the brand identity and global customers have been bridged through a network of multi-layer agents around the world who are accountable for the recruitment of professionals to select the franchise potentials, show AD fashion collections abroad, process retail orders, and carry out basic trainings. In connection to Baker's (1986) 'the evaluation of retail sites', I

observed these agents were hard-hitting on the franchisees for the quality of store functional elements (e.g. store layout). While apart from their direct examinations, they request the store managers to explain how a typical customer is through the store on a crowded day when the store is packed and emergently bizarre.

All of the evidence highlights the role of these agents to feed customer intelligence by applying standard socialization tactics as well as to keep AD's territory globally recognized by processing its integrated customer databases, web-based advancements and intranet networks in enriching the explicit knowledge.

An IT manager admitted my point of view about the healthier process at AD by saying that: "It's better to make sure that it [knowledge] will be kept safe rather than thinking about the loss of knowledge."

This reaction regarding customer knowledge loss cannot be expanded to the other two companies. For Benetton, the sales person who knows the customers are not motivated enough to share it with their seniors, one can expect that their tacit knowledge will disappear when they leave. For Debenhams, the concerns are due to the fact that the identified and valued knowledge owners are not able to find appropriate IT systems to prevent knowledge loss. Due to the ignorance of its relevance for the repository, I recorded "I do not actively record and store my knowledge" a lot during my interviews with participants who are in direct touch with customers from Benetton. It does not make any difference for Benetton and Debenhams if knowledge is not integrated in daily work processes. The risk that the knowledge creation never be processed will continue and these companies will face the challenge of unrevealed or lost knowledge (DeLong, 2004).

I found AD just in good health, but not as presented in the literature. Even though at AD systems support the senior managers to prevent losing knowledge, when I expressed my query in a positive direction, it was admitted that using technology stops knowledge held by staff to be leaked, to force an IT manager to discuss what lies underneath of this culture. 'Is your role in your company only fully understood by the individuals in your department?', I asked. He hesitated and responded, "What do you mean?" Given that he looked doubtful for a while, I rephrased it in a better way and asked, 'How do you help them to get closer to you?' "To be honest I do not want to. I prefer to keep it safe." By his declaration of thought, he tried to show he worries about customer knowledge leakage if valuable knowledge shifted from a superior set of employees to another set of employees who he assumed

to not be trustful. However, it seems to me that he worries to transfer knowledge as his job security becomes fragile. The fact is this culture is not constructive for processing knowledge creation, as individuals are selective at transferring customer know-how. In addition as noted by Leonard (1995), cultural knowledge supplies norms that:

“Determine what kinds of knowledge are sought and nurtured, what kinds of knowledge-building activities are tolerated and encouraged. There are systems of caste and status, rituals of behaviour, and passionate beliefs associated with various kinds of technological knowledge that are as rigid and complex as those associated with religion. Therefore, values serve as knowledge-screening and control mechanisms”.

The interesting point is in the previously mentioned fact, the effects of organizational behaviour in supply chain. As the employees in AD HQ seemed to be dynamic in social relationships and disengaged in working relationships, the store staff avert from sharing their knowledge of customers with their store managers.

The internationalization strategies therefore allows us to consider how knowledge is co-created in different scenarios (direct sales and indirect sales) and how this is related to global complexities, although I am extending this to not only include local customers but also the international customers due to the link between these companies and their international presence. To review 6.1 and 6.2, as discussed above, Debenhams established its strategy over direct business relationships, but those small numbers of franchisees suffer from systems disintegration. For instance, during an informal conversation I had with one the franchising managers, he claimed knowledge systems are localized to fit the local demand with local supply. If the given logic is adequate to distinguish between the local knowledge systems and the general structural path, the question of what ‘demand integration’ might be becomes interesting. However, while for Benetton and AD it is quite rare executive managers fly over to visit subsidiaries. In Debenhams case, at least three times a year people from HQ travel over to hold site visits and social meetings for compensating what databases have to give. We shall start the analysis of customer relationships with more details to develop the current discussion.

6.3. Specialization versus Generalization: Dealing with the Brand Characteristics

According to Birnbaum (2000), for knowledge-based firms, product differentiation that differs from a presupposed niche direction increases the risk but also increases the possibility of new market gains if fashion designs hit a demonstrative harmony. In the fashion industry, triumphant deviations are followed and quickly incorporated into the standard products. Aggregate production never remains separated from core direction.

According to my conversation with a Strategy Manager at Debenhams, it is re-emphasized that the company strategizes the variability of demand by offering a great number of brands under one roof to ease the shopping as “most little desires are offered”. This approach can be of help if the company monitors its customers for predicting their reaction to certain modifications in product changes. Having found the product differentiation strategy beneficial for customer knowledge creation at Debenhams, I discussed the case with a merchandiser at Benetton. He refused the applicability of the Debenhams’ strategy and stated, “a selective offering brings a selective market which leave the company to be concentrated on knowing its customers person to person”.

However, he was unable to continue his discussion firmly when I referred him to the fact that customers’ needs are volatile and consumption trends may lead them to do shopping at Zara, the competing company, which significantly diversify their product types. When the same comment made in a discussion with a Regional Manager at Benetton who seemed to be even more confident to my argument, he said, “Benetton is a group of four recognized brands”, which means the brand is diversified. Yet, that couldn’t help much as I found 75% of Benetton’s total international sales come from United Colour of Benetton (UCB) only from the time when UCB, to an extensive extent and Sisley to some extent, contribute to sales.

Once the above explanation has made it clear that Benetton avoids taking more customers into consideration in converting tacit knowledge in stores, the young generation-oriented market segment in effect produced its own downfall. When the staff brought negative emotion about the tight age range to light, without giving any numerical data to demonstrate the weakness, clearly, the company is forced to lose a great part of the market, which excludes young customers. Another interviewee, who

rejected the fact that Benetton ignore middle age range products into its demand planning, made one of the most noteworthy moments. The subject was given on the retailing knowledge creation process and he continued how music could be of positive effect on providing desirable physical environment where, beside young generation, older customers are encouraged to stay in stores for longer shopping so they feel good and begin to open up mouth for conversation.¹⁷

However, no evidence is produced to support this contention since the music playlists at Benetton stores were more of a Rock genre, which only would attract a minority of people. At Debenhams, this deals with playing pop music stations to make customers love their favourite music. At Benetton, a Store Manager noted that music is always important to the company to push customers to do shopping:

“Music is another competitive issue. For example, in the morning people are fresh, pop and dance music is appropriate but in the evening customers need more calm. So, I turned it to the romance or classical music. Or, on those days, which we have, sales, store is crowded and the daily visits are thousands and thousands. So, house or dance music gives them the feeling to buy more as products are going to be sold out soon”. [Store Manage]

The situations where there seems to be no systematic one-to-one relation in a store, it leave the company with no choice but to limit its analysis to data received from POS without any ideological corroboration. Instead, they could take the opportunity to participate in exploiting customer knowledge where significant chance is in hand for face-to-face open communication. Hence, it shows the lack of congruence between what a group of skilled staff did and could have done before technology being developed to help the knowledge creation process.

Although AD implements Benetton’s approach, the marketing team seeks to target focus strategy but the company’s position in the mind of luxury customers and the heart of its special design characteristics keep the demand-supply relationship safer and recoverable. A manager at AD had a condescending thought about the Benetton’s market orientation:

¹⁷ According to a research, 79% of customers in the UK have shown that playing good music encourages them to shop longer than normal (Talk about group, 2013)

“It [strong position] leads to success either by offering multiple options or one single tremendous option but Benetton stuck in the middle”.

[Marketing Manager]

He also explained that retailers at AD adopt marketing techniques including in-store observations and testing trends in colours, sizes and styles to follow customer needs on a daily basis to make sure even when the differentiation strategy is not in place, as the case for Debenhams, but last minute needs are captured via decent technologies in place and trained social resources at service.

Debenhams also worked around continuous tracking programmes. In fact, by looking at the fashion market to see the trends of product categories expansion, Debenhams set new strategies. For instance, if a really strong growth in leggings were seen, the company strived to assure that the growth of leggings mix in the stores exists. Also, it was observable how Debenhams was performing best to monitor the competitors in each of the markets. For instance, Debenhams is really strong in formal dresses, but the Strategy and Insight Team were able to see if the company was starting to lose market share there, which competitors were gaining, and the team also could look at what the company was offering in store. Then, by asking questions like was it due to the fact that that company had a new brand or a new price point, the team of experts would find the likely causes of Marks & Spencer gains. Accordingly, members could then collaborate with the teams to receive their personal knowledge for concluding the hidden competencies of this competitor.

6.4. Never Ending Social Involvements at Debenhams

The marketing literature places much emphasis on issues of customer relationships that are employed to learn customer behaviours and help the entire chain to classify their desires by means of CRM software. In order to develop a software to support supply chains, many of them have been introduced that primarily support sequential information flow (e.g. EDI, VMI) and have controlled demand information (Mentzer *et al.*, 2001). Though these applications support knowledge creation process to manage demand forecasting, they do not facilitate to foresee customers' changing needs. Emphasising the complexities in managing demand, Radjou (2004) points, “As manufacturers face this growing variable, they must break down the rigid boundaries between customer-facing activities and supply chain operations where

technology that purports to integrate CRM and supply chain management systems is not the sufficient answer”. This thesis argues that while these are of course important, it is external and therefore to understand SECI we must first look at the socialization process in which a range of actors contribute to the brand image.

For Debenhams, the attitude toward socialization is more customer-oriented as I observed them to be self-going. They quite often deal with the ‘customer problems’ in their informal meetings. They usually asked why customers do or do not facilitate the marketing team members during their market studies at stores; how customers need to share some essential cognitive framework if they are to benefit from Debenhams’ services and products. Something staff questions is what it is to be 30 has changed and what it is to be 40 has changed. In fact, Debenhams’s 60-year-old customer now is younger and dressing in a younger way than they did in previous generations. Hence, the company strives to make sure the product offer is in line with demand. For instance, with Debenhams older brand in classic women’s wear, there was feedback stating it is a bit too old-fashioned. The strategy team works to make it a bit younger for meeting the customers’ needs now.

In practice, a few years ago Debenhams identified that there was an opportunity to sell sportswear, as customers were eager to buy their own sportswear at Debenhams, too. It was a new department and through understanding that customers were looking for it, it became a potential to the Board. Thus, some studies that came out of sportswear made obvious that there are younger customers that want trendier products and none of the current brands covered that. Introduction of a new brand that would cover the younger, trendier customers would be taken into account. At the same time, what is considered rewarding for Debenhams due to its customers’ taste orientations and their knowledge is examined in practice, for Benetton the following response from the product team member regarding customer involvement in socialization with customers is discouraging:

“It does not mean that if I order this product, which has not been sold last year I will not order next year. Why? For the reason that the trend needs time to travel across oceans They [customers] start learning how to wear it a bit late”. [A member from the Production Team]

This response is consistent with my findings, which indicate that Benetton may be largely neglecting socialization since middle management role is given away to IT incentives in value creation. Rather than giving the way to exclusively computerized programmes as the evaluating factor for measuring supply chain capabilities to recover complexity, which would stand for Benetton's knowledge creation structural support, research may focus also on the way which knowledge is created among intervals when they utilize their experiential know-how. Here, socialization may seem to be the same as accepting what supply chain members' think about the sociological aspects of the relationship, which should not be neglected as part of supply chain knowledge creation.

For this reason, much of these added values come from the unpredictable nature of fashion customers and changes from the time a retailer places an order to the time the products are supplied to the end customer (Hines, 2004). To prevail over demand complexity, Aimi (2005) proposes "longer lead time is a strategy that global companies use but they're less confident about dealing with greater variability in lead times. Such variability has a large and unpredictable effect on critical metrics like perfect order performance, customer-service level, and inventory accuracy." Generally, the forecasting is derived from the demand history and its variations. Also, there are some factors that can control the changes in demand.

Cohen *et al.* (2006) entitles those factor as 'incentives' and explain that "since we know that incentive should be effective in influencing performance, it's reasonable to expect that organizations using incentive compensation for forecast accuracy, inventory turns, and on-time delivery would have better forecast performance, inventory turns, and delivery performance respectively." Other effective factors on customer demand can be change of customer behaviour. Cohen *et al.* (2006) support this by stating, "provision of incentives is not enough to compensate for the difficulty of predicting customer behaviours and buying patterns." Therefore, predicting demand instabilities and behavioural alterations are still what retailers should deal with.

It is particularly important that customer knowledge networking also be of use for designers and retailers to focus more carefully on the new product development phase. In contrast to Benetton, the International Manager emphasized the importance of socialization process to diminish demand complexity at Debenhams:

“It’s about customer research. So, we discuss with customers. We ask them what they think. Our customers not necessarily want the cheapest price. They want added value. They want additional detail on to the products. So, they just don’t want the basic shirt. They buy that at Primark. But what they tell us is something like Jeff Banks and John Rocha. What’s the level of Cotton that you use in it? You are going to then look at the competitors’ similar products. Maybe the competitors’ product is not sold well. Then, it seems the customer doesn’t want that type of products any more”. [International Operations Manager]

This quote comes as no surprise that the knowledge creation process at Debenhams is specifically toward endless socialization meetings between design team members who want to finalize their projects as to whether to order an item or not. To describe the working atmosphere in there, it is stated by one employee that, “the atmosphere is very relaxed and informal in our division, compared to the rest of the company”.

Given precise attention to the retailing tier of supply chain, some managers felt obligated to resort to an unusual person-centred form of authority as a means of establishing a knowledge creating mechanism to create customer knowledge in every Debenhams’ demand side as well as in Benetton’s franchise stores. In Debenhams, knowledge creation is associated with the idea of systematic reasoning; staffs at stores, in fact, are appreciated for their attitude in mapping problems as a form of procedural patterns:

“I think more that a system it is more procedure. Within a company you have a lot of tasks, a lot of people doing their jobs and must make sure that they are doing their job correctly. They have to go to a number of sonnets. So they have to go to a range of meetings ... to look at the products and make sure that that designer does not look like another designer. He makes sure that if that designer is made for 30 years old. If that is our key audience you make sure that the product is for someone aged 30 years old. I think there is a number of procedures in there which keeps everyone intact. So, they have the opportunity to stop something failing before it fails. So, the knowledge we share within those meetings and strategy meetings. In another words, yes you have done your job

great or there is an issue. Why? This t-shirt was rubbish. Was it because of the way we position it in the stores. Was it the key audience? Was it the fact that Primark sells it at half price? What were the lessons we learned?” [Marketing Manager]

This approach facilitates the conversion of tacit knowledge to explicit knowledge in externalization mode as the awareness of social cause and effect interactions are inherited in different elements of demand chain organisms in contrast to Benetton’s stores where the work alienation separated store staff from the customer knowledge creation process. This noticeably follows Barker’s (1993) justification of Marx’s theory of alienation and technological control: “[It] resulted not only from technological advances ... but also from worker alienation and dissatisfaction with the despotism too often possible in simple control. But technological control proved subject to such factors as worker slow-downs”.

A Store Manager completed my observation on the lack of job involvement and customer identification at store by responding to my question regarding his role in knowledge creation: “The employees’ interactions within the company are important. But, they will share their knowledge if they get good support from their managers.” It is an ambiguous statement from an interviewee who was hesitant about moving on this topic. All the same, it clearly got to the bottom of the power of computing decisions, which are centralized by the Board of Directors to use IT for reducing the human intervention. This lack of responsibility regarding the involvement of sales staff, which are in intimate contact with customers, in the knowledge creation process is because the knowledge holders are those at lower levels of the supply chain hierarchy.

Nevertheless, what makes them distinguished is that for Debenhams staff, job involvements are duties not choices. A manager at Benetton, who was previously a floor manager for more than ten years, explained:

“The best way to approach customer knowledge is face-to-face confrontation in an informal environment. This gives me a great chance to touch their feelings. That is why different orders are required for different stores. For example, [at store X] customers have different tastes in comparison with customers [at store Y]. Their economical ability is different. It is also extendable to the taste of colours”. [Sales Manager]

Even though Schneiderman (1997) and Livingstone (1997) revealed that customers with enjoyable shopping experiences (in case achieved via personnel) owe to ‘helpful personnel’ as the unique way each individual impacts repeat shopping. To my eyes, such charismatic forms of authority could be found between team members who had the feeling that they were the only precious knowledge resources for the companies who sacrifice technology to demonstrate their personal tacit knowledge which gained from experience; this interviewee added, “no one else completely understands my job” when I searched for his substitute at work to reveal the signs of my argument.

Thus far I have suggested this is marked that socialization process is superficial at Benetton downstream chain due to the fact that it requires a large revolution in the retailing routine, as socialization is not found important for managing supply chain complexities. Even when in the explicit stage of knowledge creation, the board spent a lot to employ advanced technologies; knowledge creation process is partial in coherency between supply chain workforces and combination practices. Therefore, the more the company relies on structural capital, the less its knowledge creation process is to be shifted from organizational level to individuals and between individuals. This is why we will explore the issues of impartiality in employing knowledge resources at Benetton further on.

6.5. More Blocks than Roads at Benetton

One requirement for a knowledge-driven supply chain is the brand identity that is defined by da Silveira *et al.* (2013) as an internal construct to present what companies want the brand to be over time so that customers can be served in a stable manner. Thus, a company must create it coherently to be known by customers, although it still allows enough room for development. In particular, brand identity is linked to knowledge creation as increasingly dynamic fashion environment approaching to customers as knowledge co-creators to build brand and to develop demand strategies (da Silveira *et al.*, 2013).

The main divergence between companies is the differentiation in gaining customer satisfaction. While Debenhams tries to push customers to admire the company for lower prices that “allows [them] to save pounds without losing the joy of shopping their favourite products”, AD assures the quality standards which reflected by means of the design features, brand image or distinguishing customer service.

During one of my observations at Benetton stores, I interviewed a very experienced Sales Manager who was admired by other staff. I questioned how tacit knowledge converts to explicit knowledge in his daily work at Benetton's stores. He explained a number of techniques from apprenticing and mentoring to subsidiary projects. But when I scrutinized for advantages of face-to-face confrontation with customers, he highlighted:

I move around the stores to make sure that I am updated to my customers' tastes. When, I see a lady in brown just walking around and cannot decide on the blue jeans, I propose her a jean in Brown. Because, in this case she will be bedazzled with the colour even if the quality is not attracted her. Scarves are [also] really important for women, as they are far better with them. So, I try to make a mix and match between my offerings to their scarves. When someone in suits comes to the store, logically, I am not supposed to offer him a t-shirt designed with the Scarface in the middle. [Sales Manager]

Here, what is referred to "mix and match" is used however I prefer to use seller's "sense of compatibility" (Rinallo and Golfetto, 2006) instead. The products have to fit in with the style that will be common in clothing since customers combine clothing with accessories (e.g. shoes and scarves) to state their identities (Rinallo and Golfetto, 2006). I interrupted him by asking if this manner toward communicating customers gives an opinion that you force your personal taste. He added:

"I offer my customers a product but not sell it to them. It happens many times that a really good product has not been offer to them just because I am sure that they are not that expert or smart to buy it. Those people are the best targets to sell your junk stock". [Sales Manager]

This last comment demonstrates the fact that the knowledge creation process barely processed from socialization to the next level as store managers felt managing customers based on their personal thoughts. In contrast to my observations, if supply chain customers do not accept a product, it does not necessarily mean that it is high-priced. Lack of socialization with customers can be a result of not delivering the products they would have been waiting for. In addition, if the product is accepted, it does not essentially indicate that it can be accepted for future purchases. Also, unhealthy socialization with customers may lead supply chain facing risks in product availability, on time delivery, quality, cost and, in general, forecasting. These

conceptions of socialization make a distinction between socialization and other knowledge creation modes.

Furthermore was an attention-grabbing feedback I received from another Benetton member of the sales team in disagreement with Nonaka's ideology about the importance of socialization:

"Meetings with internal and external customers are not essential. Firstly, there are many of them and it is not easy to meet all of them. Secondly, those who bought my products are happy with them. If, I wanted to invite some, I should ask those who were not happy [which is impossible]". [Sales Manager]

This means, a negative perception about socialization with customers to learn changes in market, products and services (Zablah *et al.*, 2004). I imagined, this attitude comes from doubting customer, since a couple of them are unable to represent the entire market and generate ideas that are sound innovative and can be applied for managing heterogeneity in demand customization. He also mentioned: "I may order something, which I am sure it will not be bought but it's color, let other products being sold." I asked for how many years? "To me, fashion is cruel. It embodies many of the negative aspects of capitalist's societies including waste, as it is fast-paced and fashion customers have demand variability toward customized merchandising."

Here, the Head of International at Debenhams had a moral answer to this question:

"Customer knowledge is about style, quality and also price. They give you feedback whether you are right or wrong in the fashionability. Because, they don't buy it or they buy it. But can they tell you what we should buy in two years time? No. Because, it depends on the trend apart from rules in general market. But, you know who the core customer is and you know what the core customer likes. You play the product to meet those customers". [Head of International]

The shown contradiction can be regarding the fact that Benetton is not flexible enough to spend a long time on the market research projects due to the fear of risk taking associated with quick change that might be forced by customers. The consequence of what appears to be a minor change could have large change

management ramifications based on the availability of suppliers' materials, the current manufacturing process, or the cost to redesign an existing product. In fact, as supply chain begins to operate, it can become difficult for the managers to separate the routines from their everyday plans which is why they can get caught up in certain situations that will be difficult to be broken away.

6.6. A State of Gloom in Employing Technological Resources at Debenhams

In light of the basics of the theory used in this thesis, converting tacit to explicit knowledge should not be the only issue to be addressed in supply chain, but reinforcing explicit knowledge is imperative to be able to claim that the entire operational capacity is utilised for diminishing the global complexities, especially in this section of the thesis, retailing, to the absolute minimum. Arguing the Kao Corporation in Japanese context, Nonaka and Takeuchi (1995) support the importance of the combination of knowledge and highlighted: "To assure 'free access', computer systems have been introduced throughout the Kao organization with all information being filed in a database. Through this system, anyone at Kao can tap into databases included in the sales system, the marketing information system (MIS), the production information system, the distribution information system, and the total information network covering all of its offices in Japan. The unique feature of this system is that any member, no matter what his or her position or to what section she or he belongs, within the business system, has full access to the database (except for a limited amount of personal information). In other words, anyone can get access to the rich base of explicit knowledge that exists within the business system."

For the analysis of knowledge applications at AD, I also talked to Debenhams representatives to clarify how knowledge combination leads them to link utilize their structural advancements to overcome upstream complexity. There were some standard IT-Supports between all of these companies but sometimes companies called common techniques by different names. However, some distinctive systems were found which by considering their applicability highlighted the weaknesses and strengths of the case companies.

During the time I spent collecting data, I recognized an excessive similarity between my observations and interviews regarding the level of reliance on

computerizing the demand and supply at Debenhams. While Debenhams' weapon to confront with supply complexity relies on social capital, enforcing the human skills yet again also overpaid at the demand chain. Likewise, when AD takes the middle ground of having not full but a fair compatibility, Benetton outshines its structural incentives again.

Passing over the conversion of tacit knowledge to the development of acquired knowledge at stores, the demand monitorization has a second fold for those who prefer to shop online. Debenhams launched free Wi-Fi across its 167-store chain for the UK customers to empower it. Since then, they are the largest Internet coverage provider in the country which encourages customers to spend more time shopping despite the fact that with rearrangement of spending priorities, consumers are changing the amount of spending time at stores. Undoubtedly, it is a step forward providing the store environment that makes shopping more handy and fun, instead of simply providing racks of garments. In connection to recent research, it proves that the average time customers in the US spend shopping at store has been waning (Reda, 1997).

Since many customers use Apple products, Debenhams utilizes Informative Site Data Analysis (SDA) to investigate site performance by communicating with its customers via iPhone App. The company employs QR-Codes as a way to provide information about promotions and seasonal collections instantly. This application allows them to attain useful mathematical data, including data on customer visits (e.g how long they spent on browsing their website) which then can be accumulated for assessing customer behaviours.

In order to do so, a 'performance control panel' was introduced to evaluate customer data and enrich them by applying a combination of Key Performance Indicators (KPIs) received from the marketing channels. These indicators are the outcome of the company's key metrics, namely, Average Sales per Customer, Page Views per Visit, Time Spent per Visit, Percentage of New Visitors and Shopping Cart Abandonment Rate.

Besides that, customer conversion process studied for anticipation of future behaviour more precisely. Having this analysis completed, the company is able to figure out why customers decide to not buy before the last click of online shopping before the payment. As mentioned by one of the IT managers, sometimes the result is as simple as the customer does not like the webpage design and by redesigning the

website, they guarantee the last click. I probed the likely questions were certainly raised about the appropriateness of the webpage layout design to guarantee the click:

“Should all the links in the home page have same size and colour? Where should the promotions take a place? How should different products categorized to clearly take the customers to the right place?” [IT Manager]

Knowing what products put into their shopping basket but did not checkout, opens up the opportunity for a new communications, such as sending SMS or email to remind them of existence of the product on sale. Since, over 300 attributes were used to create customer profiles, the received customer knowledge can be analysed for special purposes. As it is explained: “We always knew the value of click-stream...” Later, the result of these analyses can be manipulated in form of reports make the knowledge instantly lucid for the company.

To manage online shopping behaviour, Debenhams has an online customer panel where there is an online community of 15,000 customers who communicate on a weekly basis about various issues to the business. For instance, if a new offer is released, a link might be sent to the new ad and more comments to be required. If Debenhams is releasing a new range, there might be some images of the range to be shown and customers are asked to describe the product, what brands do they think it is similar to, to try and get a really detailed brand profile. In addition, Blue Martini Software equipped Debenhams with information of search keywords that is used to get into Debenhams web page to assist the company to manage the future strategy for paid ads according to keywords.

Recently, some work with the home department has been done to evaluate what the value for money is and when someone is buying bedding, whether they understand what different thread counts mean or not, what different materials mean, or whether they prefer more descriptions about something being supremely soft rather than 250 thread count or not. Then obviously, the team was competent in discussing what wording is best to explain the quality proposition of the product, which is interesting. The thing is that the communities are short lived. The longest community is closed after 6 months and that is for a particular brand that the company kept dipping into.

The role of a marketing team grabbed my attention. A designated team was responsible for analysing the outcomes of implemented marketing methods. Micro-

conversion analysis was one of those types, which shows how potential customers could be converted to Debenhams loyal customers. In order to deliver special customer feedback on certain customers who were categorized as loyal, either in terms of their long relationships or the number of transactions they have had during short relationships, sometimes purchased products were sent to the customers with exclusive care. Interestingly, the company has been aware of the fact that the explicit knowledge needs not to be subjective and any cognitive learning from primary sources (i.e. externalization) falls under the rubric ‘combination’ mode so it is not a moment in time but a process, as old knowledge could be useless now:

“We have significantly loyal customer base. But, you can never rest back of your loyal customers and you have to keep developing. You have to retaining those customers and finding new ones and your customers will get old. You need to bring younger customers. So, you need to continue change your base”. [Marketing Manager]

To assure the consistency of customer satisfaction, Debenhams employs ‘brand tracker’ tools to investigate the perceptions of favourite brands and its changes over time. Based on the information taken from the tool, market performance can be trade-off against the predicted patterns so that managers would be able to set new strategies (e.g. setting new pricing policies) on the composition of a store’s customer knowledge base.

Based on that, customer-shopping analyses are conducted to evaluate changes based on three factors; friendliness, traditionalistic manners and quality. The marketing team is responsible for observing how those ratings can drop off. For instance, if the results dropped off in friendliness, then it shows customers want the company to be friendlier. For case in point, the reason could be related to the advertising strategies where the marketing team would be responsible for resetting the priorities for the next campaign.

Another work has been found relevant here. A new advertising campaign has come out which helps for tracking customer responses to that and whether or not it encourages customers to come into the store(s) more often. This work is undertaken by a cross departmental team of people from marketing, buyer merchandising and retail managers, as well as teams that were actually working in the stores. When customers get to the till, the staff inquired about their experience in the store. That

then feeds into the KPI programme to rank the customer satisfaction resulting from the demand fulfillment.

For instance, based on historical sales data, a brand named 'Mantaray', which is a water sports brand, serves more in stores by the seaside but the buying team in any other region is able to run a campaign to assure the Marketing Department of that particular off-shore store does well for a certain water sports brand. Consequently, for the next collection period a new series of orders will be placed.

The numerical analysis also takes place by employing RFM (Recency, Frequency, Monetary). It compares previously externalized knowledge about visitors by quantifying when a customer shopping visit last occurred (recency), how often they shop (frequency), and how much the transactional value is (monetary). By means of this analysis, Debenhams analyses segments and sub-segments of its customers. Furthermore, the application of Campaign Analysis highlights how quickly the customers' responses are to a promotion by means of click-through rates, emails opened and related revenues.

For implementing knowledge combination at Debenhams, the company still does not have much in the way of optimizing retailing knowledge in comparison to the other two case companies. Although the company did an amount of work with IBM on the website to look at how to up sell, this was still a basic job as it was how to run a website rather than optimizing customer knowledge. Additionally, there was a piece of software which basically balances the amount of stock in stores and decides how much stock each store ought to have. Hence, if a garment was given, the stores had a number of different sizes, a number of different colours, and that balances out the right number of sizes, but that was more to do with demand management rather than optimization. With the optimization software, juicy knowledge could have been implied. The business system controller at Debenhams defended the company's strategies and argued:

"Ours is quite simple because our stock doesn't degrade like food would do. It's got a lot longer shelf life. The shelf life is infinite for most garments other than it goes out of fashion, but optimization you would use more if you were dealing with meat or fish..." [Business System Controller]

Certainly, managers do not stick with any question that fails to stand up to extensive description, but it is interesting to see that one of the leading staff is hesitating to defend the proficiency of the knowledge bases. However, I was sure that this interviewee knew the case was not limited to the supermarkets as the competitors employ more advanced knowledge systems. In general, the participants in the research had different ideas about the Debenhams technology based demand management. Answers were in disagreement from how good the systems are in making their tasks straightforward, to how insufficient they are to manage a global business.

While the IT Manager described it as “The IT is enough for us to do our jobs it is not all singing and dancing. It’s good enough for us to do our jobs”, a Head of Import and Export Department explained it as “...our weaknesses, I would say it is our IT infrastructure. As good as it is on the surface, underneath it is the look of swan on the lake, which looks graceful on the top. There is not great deal of continuity between systems. Still lot of manual processes in there.”

Yet, according to Systems Controller, many old-fashion systems were updating and new functionality will be added in order to make them more supportive. These systems have been developed to help employees, and integrate them with their daily tasks and upgrading their knowledge levels. In spite of this, staffs insist on avoiding the large amount of administration work that the systems added to their routine jobs thanks to the appreciation of old-fashioned paperwork at Debenhams. There was also advantage in the way the company writes some of the systems internally. For instance, there was something called ‘Endless Aisle’ in the company’s websites. Since there is an amount of stock hold in the warehouse to support the website, if that stock is not available when a customer tries to buy something from the website, then it will be looked at. If the product is found in a store, Debenhams supplied it to the customer to match the demand on the website.

However, when there is no room for system integration, there is no solid examination to measure the likely efficiency of the outcome of the systems. The use of software in this case, allows knowledge off its tacit shape on the mind of managers (Szulanski and Jensen 2006). It is in line with Hexter, Stoian and Philips (2010) as in international collaborations, national cultural differences can lead to complexities in the relationship, and may lead to business failure. Success is achieved through effective way of combining complementary skills, resources and capabilities.

Choosing an appropriate strategy to manage a collaborative arrangement is vital in its success.

Therefore, some high level decisions would have been based on peers of employees who might make use of their own knowledge to add value. Even, when some composite software were in use, they were internally written to lower the cost of structural capital, which is fair, but they would not work productively as many errors reported. For instance, in the data warehouse, internally programmed CRM software was in place.

However, the company's CRM is not very complex as it is written by the company's IT specialist for the internal use only. It basically worked on what transactions are made through PoS, or what transactions are made through dot com. In addition, it took care of the credit card number associated with customer transaction, the value of the transaction, the products bought out and other analysis. The Customer Analytics Department is in charge of CRM analysis and his team members logged onto the warehouse in order to write reports based on received data and share experience. Therefore, the IT group supplied them with a massive amount of data and they could, for instance, chuck out cosmetic offers to women who buy cosmetics and to be served in the way they wanted rather than everybody.

From this time, it is to say, again, many of the sales people were able to externalize ideas by uploading their own sales tools, such as presentations and hand-outs, through the course of their jobs into the software, but the main challenges of having such undemanding knowledge systems are costly to be run through the whole chain. Therefore, I greatly disagree with Norman (2002), Vandebosch and Gallagher (2004) and Postman (1992) who assume limitation in utilizing knowledge facilitates the operations by reducing the load on memory and increasing the capacity to inspire human sociability. This is due to the fact that the knowledge creation process has epistemological level and the conversion of knowledge requires a collective approach toward the availability of resources. Especially, Debenhams has a variety of brands with thousands of products. It would be easier said than done to develop a compatible complex humanistic relationship and share knowledge between all of those channels as software programmes only developed for organizational limited usage in most cases.

6.7. Not Following the Model but Practically Fair: Employment of Technology at Benetton and AD

It is argued that recent studies in knowledge management is not flexible enough to understand the importance of intangible factors in creating knowledge and therefore, the authors emphasize the technological competence of companies to create a story which is in alignment with previous data to stay relevant to the historical context. As we have concluded from the theory, if socialization does not happen, new knowledge creation is unfeasible (Polanyi, 1967). At the same time, since socialization mainly relates to the knowledge residing in customers, it is not as easy as explicit knowledge to be dug in.

Hence, for Benetton mainly, the challenge in facing with demand complexity may be due to lack of substantial human effort for integrating customer knowledge in social interactions. Even more surprising is yet to note that to collaborate over converted demand tacit knowledge as system's ability to summarize quantitative results could be learned only by specialists within predefined boundaries (see Chapter 5). Nevertheless, there are many solutions to manage customer explicit knowledge through structural capital at these two companies.

For AD, loyal customers are also unconditional sources of knowledge and therefore, it is a part of a plan to send them birthday messages by SMS service to make them feel they are always connected. Moreover, AD informs its gold customers if a new collection is about to be shown in the stores or on the website by sending them a postal package including introductory presentation of new collections. Although the case companies use gift cards to facilitate customer services, AD was the sole company that gives special offers throughout the year. Interviewees found them a vital source of creating customer knowledge when tracking customers' personal buying behaviour become possible. I also have been found that recently, Debenhams has agreed to launch its first foreign language website for Germany to develop the brand internationally. For AD, the website is still strangely delivered in Spanish language to a great extent. This language selection is mainly based on Referrer Analysis, which led the company to observe traffic from search engines. Also, by Path Analysis, which evaluates the helpfulness of various links on the Debenhams home page, Debenhams found an extensive contribution to feedback from its German customers.

The day-to-day communal accessible web tools in companies' knowledge systems were introduced as discussion forums, shared databases, knowledge warehouses and also workflow applications. By utilizing shared databases, customers are able to interpret and revise databases where they have given the right to use internal archive which can be controlled by internal staff. Basically, warehouses store credentials with knowledge inserted in them can be retrieved via specified websites. So, exterior negotiators, as introduced earlier, can be allowed the right of entry to catalogues, manuals and documents to get along with decisions linked to customer knowledge. For AD, technology advances knowledge externalization and makes it explicit for later complex analysis. For Benetton, it is the access of documents, such as videos showing its infrastructure offerings for web users through the company's website in cyber environment quite similarly. To ensure that senior managers were adequately prepared to use the system, Benetton implemented executive long-term training plans with internalizing detailed documentations that were written specifically for those top managers.

One of knowledge systems introduced by IT department at AD is workflow applications which were defined as the business process, automated system that passes information or tasks documented between member of staffs for accomplishment process. In accordance with a series of procedural regulations and then discussion forums, a common application for all of the cases that permit the participation of customers to express their needs are provided.

For instance, AD suggests customer to include their design ideas on the discussion forums and offer latest substitute products. Since the supply chain is complexly integrated, end-to-end ICD knowledge systems transfers design ideas to manufacturers to enable end-to-end visibility. As the development of steppers moves toward ICG technology, knowledge is much more available everywhere to be combined into procedural practice throughout the chain. While ICG supports AD in phase of explicit knowledge-based innovation, Benetton Decision Support System (DSS), which is called BOARD, proved that merchandise planning and performance management uniquely, and markdowns and optimizations integration, are customized to treat demand. However, when demand changes with trends, the increasing possibilities for customer co-creation yet again needs to be converted to tacit knowledge in internalization process. While Benetton and AD are compatible in internalizing supply knowledge in downstream chain, for upstream chain when

customers are key partners, collaborations seem to pursue non-collaborative strategies.

Based on the analysis provided above, the main characteristics in processing knowledge creation at upstream side of supply chain are summarised in the following table:

Table 13. The comparison of the recognition of knowledge creation process at downstream side

	Debenhams	Benetton	Adolfo Dominguez
Core market	Local	International	International
Main international expansion strategy	Direct investment	Franchising	Franchising
Local market adaptability	Low	High	Medium
Brand characterization	Generalization	Specialization	Specialization
Target market	Medium market	Medium to high market	High market
Customer identification in store	High	Low	Low
Technological adaptability	Low	High	Medium

6.8. Conclusion

Following downstream supply chain processes in Chapter 5, the assumption that an upstream supply chain can be studied has been under discussion. To explore customer knowledge, according to Becker (1964), how employees use economic logic to learn from customer decisions is related to the investments in knowledge (firm-specific knowledge investment), career choices (labour mobility) and other employment characteristics (wages) (Gimeno, *et al.*, 1997). How are they in employing knowledge creation process for responding to their global customers when they differ culturally and are scattered geographically? What my analytical intention is includes how staff and technological resources are utilized to co-create knowledge with customers based on the SECI process leads to the emergence of customer

satisfaction. This chapter which draws on a variety of marketing techniques as it is found to be the most fitting when discussing upstream supply chain knowledge.

It is discussed that customer knowledge management goes through the survey of the socialization potential, through the recognition of the potentialities strategically in order to develop, and through the necessary development to convert tacit knowledge to explicit knowledge. That is, the customer knowledge configures as a great referent of success in the supply chain environment, which determines the accuracy of forecast. Hence, if there is not adjusted management for processing customer tacit knowledge, no supply chain will be successful with its strategies and consequently, it will not reach the expected results for being competitive in the market.

This is also demonstrated that all the intelligence that "stays after 5:00 p.m." such as communication, decision processes and control systems, are organizing capabilities for these companies so quite necessary to produce detailed knowledge to satisfy customer demands (Stiles and Kulvisaechna, 2003). To utilize these resources, complexities quicken knowledge distribution, increasing knowledge collections, diminishing waiting time where productive knowledge workers are required.

Therefore, rather than focusing on how customers act in response to marketing strategies (as this is not important in customer-driven supply chains), knowledge creation is used here as a lens through which to look at how retailers co-create knowledge through social interaction and combine different experiences to meet satisfaction.

7. Conclusion

Over the past decade, the fashion industry in Europe has suffered from severe competition from the arrival of new competitors from emerging economies and intense competitions with cost-cutting retailers, such as British Primark, Swedish H&M and in particular Spanish Zara which has had a significant impact on the demand side by its economical fast fashion format (Verdict, 2007). Mutually important to note, these tremendous changes in the present climate are also followed in the face of a more vigilant, discerning, and less dependable customer (Intel, 2007). In order to study the current trend, this thesis is an account of knowledge creation extensions in inter-organizational relationships. It has examined the knowledge creation theory in the increasingly complicated global environment in which companies originated in three European countries and operate in fashion, namely the UK, Italy and Spain. It has endeavoured to untangle complexities within supply chain, studying headquarters, the downstream and the upstream links of both, to frame the individuals and the organizations and therefore, the way knowledge is created tacitly and explicitly (Kogut and Zander, 1992; Grant, 1996; Spender, 1996; Liebeskind, 1996; Nonaka and Takeuchi, 1995) within inter-organizational boundaries.

This study develops the understanding of current atmosphere in the fashion industry by analysing the various ways in which knowledge creation is enriched. At the centre of the argument is the concept of the supply chain itself, which is found to be challenging particularly in long distance in-direct relationships. This thesis also demonstrates how valuable the link between individual knowledge and organizational knowledge is in the embodiment of the supply chain knowledge creation model and how the balance between them prevents knowledge loss throughout the chain. In order to direct knowledge creation, companies must position themselves in line with each other in supply chain, socializing their own knowledge, absorbing the knowledge of others (i.e. externalization), combining it with their own knowledge and transferring it to their partners (i.e. internalization) Within these knowledge domains, there are many aspects that were tackled.

Criteria included how the supply chain companies shared knowledge of the operations, demand, manufacturing, procurement, product and commercialization. The application of a knowledge creating supply chain could be as simple as direct

solutions to supply complexity (e.g. working on a trial on handbags to balance standard operating procedure at Debenhams). It could also be as complicated as a overall system complexity, with different functional targets and their relevant decision making plans and the outcome or the anticipated outcome of those action plans (e.g. adopting a built to order approach (BTO) in manufacturing tier at Benetton). This explains why a product attracts customers, which again shows the anxiety of customers involved in the supply chain cycle as companies have to sell their products by knowing consumer behaviours.

The purpose of the study was to fill in important gaps in the existing literature relating to how knowledge creation competency could access the inter-organizational level and it is examined by the involvement of knowledge resources, as outlined in the literature. The study has been a bottom-up understanding of the fashion industry in terms of how managers react to the applicability of knowledge creation as proposed in the theory, as well as considering the individuals and their roles within knowledge-driven supply chain (e.g. middle managers). The research questions were explored by analysing the relevant literature and through semi-structured interviews and observations of professionals in the case study firms. The aim of this approach has been to consider the skills necessary for firms in initiating available strategies to confront supply chain complexities, for instance, the level of globalization in the supply side (e.g. expansion in the number of Benetton global suppliers vs. substitution of Chinese suppliers with Indian continental suppliers for Debenhams) or demand side (e.g. wild growth in the number of global franchise opening stores in Asia and the Middle East for Benetton versus slow entry of Debenhams in the US). This research has therefore, not only revealed rich evidence for reflecting on the variety of knowledge creation strategies needed for the implementation of the theory but has also presented the challenges and limitations of work.

7.1 Summary of Research Findings

As research around knowledge has been entering the management literature, a review of interrelated literature was the first mission of the thesis. Chapter two provided an analysis of the current literature on the process through which knowledge creation was considered during the last two decades, and then it was followed by an analytical review of supply chain management to pave the road for the examination of

knowledge creation process in inter-organizational level in the general approach and as its specific approach for fashion industry.

Chapter three presented a choice of possible methodologies for this particular thesis, arguing that a combination of interviews and observation would allow for the multi-level analysis of the cases. The investigative framework for the multi-level analysis of the study was also set out to ensure a holistic perspective of supply chain as taken while keeping the focus on socio-technical knowledge and how this knowledge is produced by various means and methods. It was argued that the critical theory is the most suitable paradigm when criticizing the nature of existing strategies based on the understanding that was found from the theory.

Chapter four to six analysed the empirical findings. In Chapter four, an overview of intra-organizational knowledge creation was undertaken to clarify the individual and collective readiness of firms before involving the network relationships. This was crucial to compare the internal willingness and external compliance provided for readers. To a great extent, the findings highlighted the main knowledge creation cultural eventualities in organizational boundaries exposed as pivotal in supply chain relationships. It also allowed for an analysis of the way individuals construct and organizations manage their knowledge creating identity before these characteristics became barriers or speed for supply chain knowledge creation. Issues around the position of middle managers, learning and training plans, teamwork for interdepartmental projects and the employment of technologies were discovered around the SECI process, disclosing the necessity of involving leaders to emerge employees' ideas during face-to-face meetings, as well as utilizing infrastructures for either the combination of individual knowledge or the replication of knowledge for further future analysis.

Chapter five examined the downstream supply chain knowledge creation process beginning with the inspiration of design ideas in socialization between designers; continue with characterization of the fashion products in manufacturing tier, and complete in distribution of products to the market. Undeniably, being master in socialization mode is to whether the design tier will advance knowledge creation. As such, it is essential for designers to explicitly share ideas with colleagues, as is the case of the great influence of top manager in designing with top managers, and a wider audience in social dimension in order for their work to be considered mature enough (i.e. combination mode) to be sent to manufacturers where information

technology helps most to provide a global picture of objectives (i.e. conversion of explicit knowledge to tacit knowledge). While the accumulation of social relationships might be critically important in stimulating ideas, the endorsement process is underlying facilities to link design ideas to computer-controlled software programmes.

Chapter six explored the notion of retailing in upstream chain, taking knowledge creation as a lens through which to study customers as a source in understanding the relationship between market and supply chain, and looking at customer knowledge highlighted to what extent supply chain knowledge relies on market intelligence. It also further interpreted the inherent differences final customers must navigate during their shopping experience in indirect sell (e.g. franchising system) and direct sell.

7.2 Research Contributions

The discussion chapter provides a review of the main issues argued in the preceding chapters and answering the research questions. Here, both theoretical and empirical contributions, the limitations of the research and prospects for further research are highlighted. The main aim of this study was to understand how firms manage knowledge creation process, how knowledge resources are employed throughout this process in acquiring supply chain knowledge creation, and how working under knowledge-driven supply chain decrease supply chain complexities in the global dimension. This results in firstly, the examination of how firms consider their social entities where supply chain members collaborate to coupling tacit-explicit knowledge for new knowledge creation. Secondly, it results in the exploration of how managers recognize the employability of technologies in order to strengthen what workforce activities lack.

These questions are illustrated by arrows in the theoretical model in Section 2.4, and inquire how the perceptions about knowledge creation held by supply chain partners influenced the availability knowledge resource types and the degree to which the decision-making process were stable with conceptual principles. The implications of these findings to answer the research question are discussed further below in two parts; first to show the complexities of supply chain for fashion companies, and then how managers employ knowledge resources for processing knowledge creation to overcome the acknowledged challenges.

The Recognition of Supply Chain Complexities

A view of global supply chain complexities is supported by Worthen's (2007), Thomas and Iyer's (2006) and Cudahy *et al.* (2006) research of companies with high global trade volumes as it affects how they manage resources in their daily routines and strategic decision-making to increase revenue. To have a competitive global supply chain, firms need to overcome complexities associated with the cost and the required delivery time, quality, and service according to the requirements of the market. And since then, the types of complexities can be categorized based on the case companies' unique supply chain strategies by three features: 1) Debenhams; the perceived knowledge creation support for cost driven supply chain; 2) Benetton; the perceived knowledge creation support for quick response driven supply chain; and 3) AD; the perceived knowledge creation support for quality driven supply chain. These strategies are unique to these companies to process the value creation in which individual deliberately searches for the application of the theory that can change state of managing supply chain. Based on my personal observations, contrary to what is accepted as a general model, having customers with clashing preferences results in varying outputs of knowledge creation with characteristic goals of these companies; that is why the cost of investment on knowledge creation can vary in companies from one department to another department.

There was a broad set of literature that covers how firms develop knowledge creation incentive for profit and what uses they have for the knowledge. Since then, based on the findings of this thesis, while different strategies emerge over time in multiple ways, main supply chain strategies that impact the approaches to create knowledge are summarized in table 14.

Table 14. The adaptation of supply chain strategies

Supply Chain Strategies	Debenhams	Benetton	AD
Design	Mixed – based on trend forecasts 18-24 months in advance of seasons.	Internally designed and externally produced – based on IT to transmit visual design to samples	Internally designed and produced – based on trends at seasonal catwalk shows
% of total manufacturing in the main route	70%	75%	95%
Main manufacturing route	Industrial production	Commercial production	Special production
Manufacturing strategy	Low cost- Availability of products	Quick response	High quality – availability of products
Manufacturing activity	Low cost suppliers mainly located in Asia and the Far East	Subcontractors mainly in European production poles	Skilled suppliers mainly located in Europe
Batch size	Large	Medium	Small
Lead times	Long lead times can take up to 12-16 days	Short lead times 8-10 days on average	Short lead times 15 days on average
Replenishment	Replenishment orders based on pre-agreed contract prices with suppliers	Fast fashion	Replenishment orders based on automatic inventory level plans
Demand	Forecasts fairly in advance of season	Forecasts near to season based on real time demand data	Forecast near to season based on the records from stores

It illustrates the acknowledged supply chain strategies that seek for those references to highpoint different practices between firms and since case studies focused on abovementioned features differently, the applicability of the framework can be demonstrated inversely. In this analysis, I reported that the aggregate

proportion of employees' involvement in Debenhams observed more than the other two cases. I analysed the impact of technology at Benetton and AD on this substitution away from less-skilled labour and concluded that the displacement of workforce in their supply chains was due to technological change being skill-biased against creative individuals. It is identified that there are two main reasons behind these divergence of interests. Benetton and AD find that technological resources as a substitute for human resources and that it complements a few number of professional employees who probably have family likes with the founders (i.e. Benetton). This shift favouring that in long-term systemizing the operations becomes cheaper. However, system complexity that can be facilitated to increase visibility is just one type of complexity whereas the impact of socialization mode in converting tacit knowledge has shown that is crucial on skill and therefore managing demand complexity. Here, in accordance with the demonstrated strategies in table 14, in managing supply chain the following figure indicates how companies may encounter the complexity of supply chain in five forms, systems, financial, replenishment, demand and supply complexities, and the way it could be linked to the inter-organizational relationships.

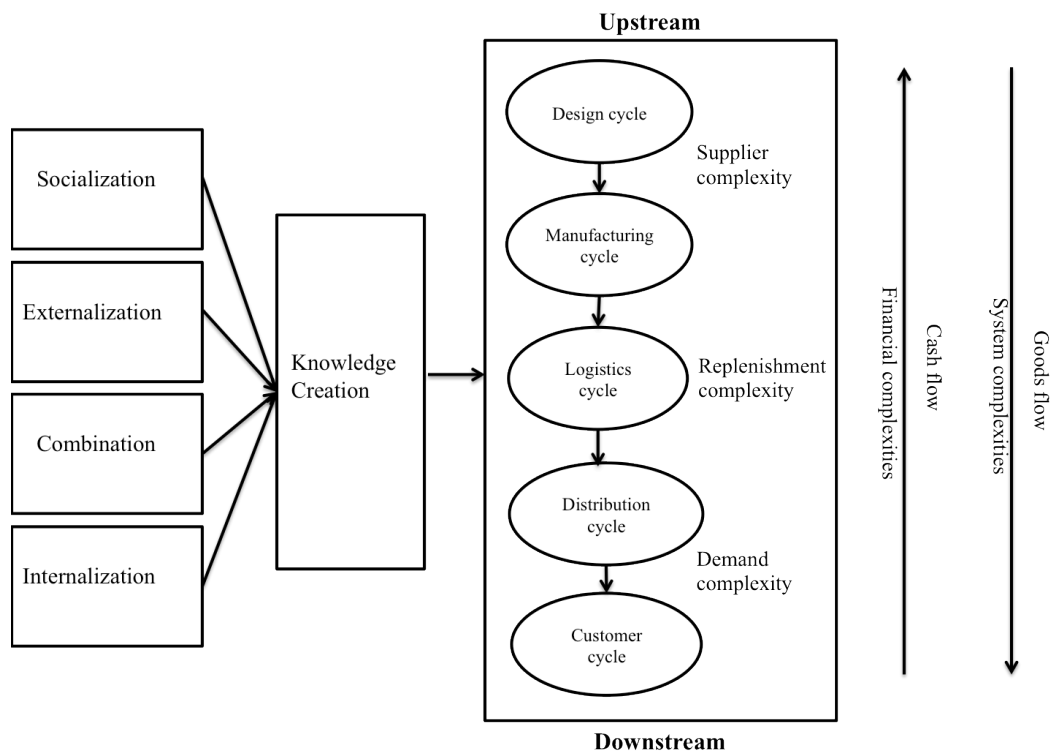


Figure 15. Managing supply chain knowledge creation for potential complexities

Regarding financial complexity, it maintains that the operations are the result of multiple echelons of regulatory compliance to respond profitably to customer demand. This complexity observed to be twofold; firstly, the lack of cost visibility that relates to each tier of supply chain which occurs when there is no systematic approach toward documentation, and secondly, the cost of implementing technology as a model of computerization of operations. According to the analysis chapters, this complexity mainly impacts Debenhams that has the lack of power of setting institutions for the member of its supply chain. Although they enjoy the high flexibility in hiring and firing employees, plus the cut in wages of global human resources due to the adjustment of salaries with low levels of services (e.g. workforce education), its complex supply chain model has caused a lot of waste.

System complexity primarily refers to the incompatibility of supply chain infrastructural resources to synchronise activities between companies. It can get more complex when the system does not even respond to the internal issues. For instance, it is discussed in Chapter six that system clash occurs regularly at Debenhams when they support the entire clothes operations internationally with Payroll as well as Point of Sale systems (PoS) hosted by IBM. In spite of the fact that the investment on IT indicates a step toward mechanization of the operations, since these two software are written in different languages to control two distinctive operations, the IT team decided to stop offering foods from the DCs to the franchise partners.

Accordingly in contrast to Benetton and AD which technology substitutes employees performing manual and routine roles, problem-solving and complex communications task in high skill (managerial), Debenhams face with system complexity by increasing the hierarchical level (see Chapter four) to which they are filling the gap of technology. As indicated, above system complexity can largely be related to the high cost of system development, staff training, and managerial resistance to change. Nevertheless, the risk of sticking to old-fashioned methods in global scheme can be higher than the cost of integrating processes to systems when effective supply chain management is dependent on managing beyond organizational borders. At that level, each process, data element, and system must be clearly acquired and dynamically combined.

Replenishment complexity is also another challenge that observed within data analysis chapters when at some points the quick facilitation to the changes in demand was disabled or slowed. Consequently, instead of filling supply chain functional areas

with demanded products it was occupied by unwanted goods. It was discussed that Benetton's strategy to 'manufacture now - dye later' help replenishing the buffer inventory in distinctive stock points and discontinuing production and shipment once buffer inventory levels are moved. It is the case for Benetton, while for AD being in a production cluster is proven as an advantaged to diminish the replenishment complexity and increasing customer service by avoiding extra delivery cost. In contrast, for Debenhams, the length of logistics and custom paperwork seem to be a drawback and it causes an increase in the length operations as a result of insecure poles of delivery and long transportation distances. This is mainly because there are many intermediary players who impact the process by their languages, currencies, time zones and cultures that are inherent in global sourcing from cheap suppliers (see Chapter five Debenhams sourcing from China).

Supply complexity is an outcome of manufacturing challenges regarding lack of labour competency or poor skill levels and the insignificancy of technological enables to reduce manufacturing lead-time and production runs. This can be very broad that covers who suppliers are (AD owns the production plans while Benetton does not), how they seek for raw materials, and what uses they have for the design. Benetton has focused on seeking by its East European suppliers to diminish Italian manufacturing costs while Debenhams categorizes these vast set Asian counterparts. Here, there is still no RFID system in place at Debenhams while Benetton and AD make the most of it for accelerating the transformation of supply. RFID could be used to decrease supply complexity whereas garments identification increases when transported within and between suppliers.

Lastly, demand complexity follows the delivery of the right product with the right quantity at the right time to customers who may live at different geographical locations. Based on the above table, among the criteria for acknowledging demand complexity, the levels of product differentiation and assortment and the degree of required customization are highlighted. This is mainly concluded from the specification versus generalization section in Chapter six, that the level of product varieties could positively impact the complexity of demand planning and therefore forecasting demand planning. To review, since AD produces less product types, its demand prediction is a straightforward procedure and its risk of failure will be lower than Debenhams, which offer more than 10,000 product types at each seasonal collection.

These complexities explain why, to a certain extent, knowledge management is conceived of as a management tool, which again highlights the control issues involved in supply chain management. Companies have to look towards a long-term relationship, which is built on the capabilities of the involved parties to create knowledge. The implications of the findings are discussed further below which answers the second part of the research question regarding how managers employ resources for processing knowledge creation to overcome challenges.

The Employment of Knowledge Resources to Process Knowledge Creation

Like any decision-making activity, the encouragement of top management team is decisive for the success of knowledge management resourcefulness (Davenport, 1998). To answer to this question, it might be more pragmatic to say that there is a balance between the conservative and more open-minded managers. Those who believe in the value of knowledge systems and entrust that customer and supplier knowledge will be misleadingly communicated in this immense relationship, if communicated at all (examples mostly from Benetton and AD), and those who have a contrary belief that the understanding of seller and manufacturer are different of an incident, and it should be studied as it is, not attempting to provide a common language (i.e. beginning the conversion with externalization), as the meaning can be lost in interpretation (i.e. Debenhams).

Based on data analysis, these positive or negative credits can be classified into three groups: 1) organizational knowledge structure and the business environment; 2) knowledge structure; and 3) knowledge surrounding organizational boundaries that are the dominant factors which are considered by top managers to create new knowledge.

I analysed knowledge creation process and acknowledged managers closely related organizational variations, which various alternative causes of within-organization knowledge improvement have been found as the impact of managerial approach to technological change. I have used both individual-level and organizational-level evidence to demonstrate that use of knowledge sources tends to have an effect in the way knowledge is created, and I have found many examples which can have an impact on the strength of the strategies to resolve supply chain complexities. As established in the literature and through the interviews, studying the intra-organizational knowledge creation in relation to finding its impact on inter-

organizational knowledge creation is a relatively new route of research in supply chain studies. In this thesis, it came out in the empirical analysis in terms of an encouraging shift, the interviewees were much more strategic in planning observations, imitations and practices for the completion of tasks in collective works inside their boundaries.

While in great number of occasions the organizational social tense is found to be more responsive in following the conversion of tacit knowledge to explicit knowledge, Benetton discourage that and AD managers severely cut the role of internal middle managers and mechanize the intra-organizational work unless the need for enriching tacit knowledge is outsourced to a third party company:

At AD, socialization provokes new ideas in the design tier, this lack of social effort associated with weakening the employee involvement, the organizational process to individuals and groups who previously learned responsibilities by internalization mode, and what became their knowledge now in human-technology interaction is transformed to explicit knowledge. In other words, simply based on the type of job being done, managers skip the conversion of tacit knowledge in socialization mode and neglect a range of practices like cross training and job rotations which is used to improve individual tacit knowledge at the beginning of the process.

When the concept of socialization as an initiating mode has become ignored intra-organizationally to revitalize creative roles, the frequency of tactics resulting in a decline in the number of circumstances that individuals were reluctant to learn and therefore more ideas were banned to be flourished, less skills were exercised and specifically, creativity and innovation do not imply so that employees contribute less in combining personal knowledge.

However, while innovative ideas are necessary for converting tacit knowledge for processing organizational knowledge creation, it becomes more challenging to socialize knowledge in the same manner at supply chain level. The dominance of Debenhams over its social knowledge sources weakens conjointly inadequate integration of technologies to limit the supply chain knowledge creation which design, manufacturing, logistics, delivery and retailing are not sensible to dynamic conversion of knowledge. It was evident here, while replenishment is not narrow for department stores with great number of offerings, and in contrast to AD which products would still be expensive and profitable at discounted price, for Debenhams

the sale of end of the season heavily damages the cost cutting strategies if global supply knowledge does not link to customers. Missing the knowledge resides in customers but the design of business processes and its back-up knowledge support integrates the process-organizational view at Benetton and data acquired from sources like POS is well discussed to forecast volume before it is informed to a network of contractors.

Fascinatingly, for a thesis about supply chain knowledge socialization and how tacit knowledge is valued, there are few observations on employees' skills in terms of communication and networking; the process by which an individual comes to appreciate abilities essential for participating in a supply chain company. As individuals will create work more consciously, regardless of previous socialization experience, each new task may evolve into new setting for instant recognisability reflecting any change in the way top managers undertake decision-making. We see how the creation of knowledge feeds into supply chain long-term strategies, not only for powerful knowledge-based operations but also as a psychological aid in order to manage the insecurity between individuals who at some points feel misbehaved (e.g. Benetton store personnel).

In fact, inter-organizational tacit knowledge can also be created at the concentrated domestic operations and further, in an international dimension in transition from knowledge sharing in a single nation environment to a trans-national environment where the situation is made more complex by ambiguities of understanding between partners. Then variables impacting socialization ambiguity include the physical environment, individual perspectives, individual characteristics, background and needs of the knowledge receiver and the knowledge provider. Beyond the sign of ambiguity and cultural distance, **it is specified that** certain key construct which impact on the creation of knowledge (and ultimately knowledge development) in strategic supply activities that operate in a global context, including tacit-ness in procedural knowledge that hardly can be explicated.

This is certainly well understood by the management of Debenhams seeing the Magasin Du Nord as a training session to learn how irrational the global supply chain can be. They either get it in product as the company's buyers buy the right products that people want to buy, or in the systems and the way the company wants to do things. Debenhams get advantage from the products of Magasin Du Nord. There is also advantage in the way the management show some effort in encouraging globally

acceptable documentation and then writes some of the systems though internally to stop guessing how well customers in Qatar, for instance, love or hate a service. Most probably, the problem rises here; senior managers who have been working for Debenhams for an average of 20 years under people-centred communication methods now have been shifted to using certain technologies and its applications.

With regards to their belief of using technology at Debenhams, in fact in most cases, one has the impression that the managers are anxiously trying to direct the interviewer to the use of technological sources in relation to their relationships with customers, seemingly in order to hide the technological weaknesses that exist within the supply side. This impression is due to the fact that managers at Debenhams got tangled up in the multi-layer supply knowledge creation process where the involved parties in the demand chain side are still concentrated mostly in the UK. In other words, indirectly, it is a declaration of supply chain management with push strategies which most of the complex analysis takes place in the last sets of tier, no matter if they attempt to re-sell push systems under a another label called customer-driven supply chain.

Every so often customers do not know what they want. That is due to their unawareness of all the options they might have which would help them solve their demand variability. A reasonable question to ask at that stage was, ‘do you know what questions to ask?’ I saw no reason to ask to prevent interviewees felt awkward, but the answers were quite straightforward to me; if they know which demand complexities their products and services can solve, and if they know what questions to ask to determine whether a possibility exists to help on any of those complexities, they can determine quickly whether any of the products or services are a fit for stretching customer lifetime. One of the most popular marketing tools that all of these companies used were trouble-free pad of questionnaires that sat on the cashiers’ desks, a common method of externalizing customer knowledge.

The questionnaire forms could be designed to let the managers approach their customers’ tastes. However, apart from basic coded questions regarding customers’ general information (name, date of birth, occupation, contact number and home address) and their tastes of products (size and colour), there is a chance for the marketing team to ask some innovative questions to make the most of the answers, especially for global customers. However, it is likely time consuming and the management team should provide the required time available to a selection of store

personnel to empower customer knowledge creation by specifically listening to them and writing it down, if not convince customers to do it by themselves. Therefore, direct contact with customers should not be assumed as 'an administrative task' that has a potential to interfere with their main role of cashing out the customers as demonstrated in the case of a store manager in Benetton. Thanks to the fair implementation of customer relationship software, the problem of dissocializing with customers have been replaced with software packages reasonably at AD and Benetton, but for Debenhams, it is psychologically incomprehensible for them to leave a great money for purchasing a piece of software which to them sounds equal to recruiting dozens of elite personnel to encourage knowledge creation.

Nevertheless, the fact that how an organization is designed specifies what combination of knowledge sources should be exercised. The knowledge pursued in each layer of supply chain is limited to its product market. As an example, at AD, which has a niche market as it is relatively a new brand and as it is more luxurious branding, one of the communication methods with customers is telephone conversation with the exclusive clients, who, as mentioned in analysis of CK brand, are after expressing an exceptional character with their clothing and therefore are willing to spend huge amount of money for this particular brand. This personal relationship is one of the ways of creating explicit knowledge, which proved to be directly involved in the future decision-making process. Therefore, with creating different communication outlets, AD personalize knowledge differently here.

In many occasions, the sources of knowledge available to the firms are determined unnecessarily by the structure of product characteristics. This notion goes beyond the investigative scope of this particular industry, but still applicable due to the different nature of these companies' customers. For instance, as analysed earlier, while Debenhams massively studies a new supplier, since they do not own the plants, the company has least ties to its manufacturing counterparts.

The strengths of relationships that are formed in the downstream supply chain could be weaker and as such suppliers could become lead producers (i.e. mastering supply knowledge) quickly. Even as it was proved that Debenhams provide a creation of a supporting structure for suppliers to piece together discrete knowledge into more valuable form of knowledge – although a lack of previous knowledge to build upon is obvious - the necessity of having some type of knowledge which was lost is not experienced in the upstream chain. While these inconsistencies were noted in the

trade-off between knowledge creation process for its unique sake and profit driven knowledge creation, Debenhams tend to filter responsibilities to ensure 'cheap knowledge' is created. But how quick are they in familiarizing themselves with that cheap knowledge? The example of investment on incompatible software at Debenhams clearly demonstrated that the filtering process needs a systematic mechanization to guarantee enough knowledge creation.

Largely, this thesis found a very strong weight of the lack of steadiness use of knowledge resources to empower knowledge-based capabilities (Grant and Baden-Fuller, 2004) as a strategy to achieve collective advantages. This is consistent with Wiredu's (2012) findings that highlight the collective approach toward technology and social experience as keys to shape supply chain management competency. It further is in contrast to the research by Kogut and Zander (1995) in that individual role in creating knowledge is dependent of the collective culture; in this case, individual perceptions about creating knowledge can be a wide supply chain knowledge creation though it is shakier and less effective. In fact, this thesis explains that an ever-changing network of relative relationships determines value.

7.3 Key Implications

This study delivers a number of implications as specified below in two forms of theoretical and empirical:

Theoretical Implications

Theoretically, this analysis determines that it is unreasonable to disconnect a consideration of the organizational knowledge creation process from inter-organizational context, particularly supply chain, in which it is constructed and shaped the examination of knowledge in different levels from the individual to the group, to the organization, and finally to an inter-organizational level. There is a need for a sequential perspective of how supply chain partners attempt to co-construct a knowledge-based supply chain in the fashion industry that takes into account design, manufacturing, logistics, distribution, retailing and customer and the consumption course.

Therefore, rather than focusing on an organization, studying this longitudinal process seems to be possible on condition that knowledge creation activities become integrated both within and beyond organizational boundaries, either in terms of

product and process design for managing supply or marketing and advertisement for managing demand. As such it is neither marketing research nor supply chain rationale, but must be continually adapted in line with their multidisciplinary context.

Knowledge resources are shown to be adept at responding to supply chain complexities in terms of the challenges that may occur regarding managerial decision-making to control financial, systems, replenishment, supply and demand limitations. Lastly, by examining the role of employees and technology through the SECI lens, this thesis demonstrates the importance of considering a balance of these resources to handle the conversion of modes of knowledge. Based on the analysis done in this thesis, the nature of complexities deemed in chapter 2 were identified and categorized. A link was then established to show how knowledge creation in supply chain could have mitigating effects on these complexities or help eradicating them.

Here, it describes results determined by experiment and observed behaviour of individuals about how knowledge creation is employed, issues of technology management and social involvement in the analysis that informs observations on such data, and allowing for an in-depth understanding of how knowledge is co-created.

Empirical Implications

Empirically, it is argued here that in order to facilitate knowledge creation, it is necessary to consider that the individuals are central elements to facilitate the process from socialization toward internalization. Moreover, a time-based perspective must be considered to realize why value of individuals can change by the nature of different roles and what elements account for these changes. By looking at three particular supply chain contexts, it is possible to distinguish the fundamental authority structures in fashion industry and applicable insinuations in terms of what is known as customer-driven and supply-driven supply chains.

Meantime, the involvement of middle managers in knowledge creation process found to reemphasize that there are in-built dissimilarities reserved to support the idea that employees with more autonomy have a better chance to make decisions thank to the knowledge they have. In other words, it proves the importance of the degree to which employees believe that their determinations are valid throughout the supply chain. These dissimilarities develop over time from an individual's perceptions of the degree to which their managers motivate socialization.

Nevertheless, it is necessary to manage the network relationships by taking a technological perspective on knowledge management. Supply chain knowledge management therefore is found to require technological facilities in monitoring and scrutinizing the entire process in order to prevent knowledge loss.

7.4 Limitations and Suggestions

While the current research made significant contributions from both theoretical and practical perspectives, it also has some limitations that are presented in this last section as follows.

First, although an ethnographical investigation could give us an enriched data set on the nature of knowledge creation process by focussing on psychological dimensions of converting tacit knowledge, due to time constraints of this project (four years), this was forgone in the favour of in-depth and intensive interviews.

Second, focussing on how knowledge assists diminishing supply chain complexities, provide an opportunity to understand the socio-technological dimension of management. However, data were collected through qualitative case study and can be mathematically examined as well. Third, to provide a broader perspective and possibly different paces, further studies are crucial in order to examine the consistency of results in other industries.

Fourth, as mostly those who hold managerial positions told the stories, the knowledge creation processes were not followed from the front-line employees' perspective that might have had different viewpoints about actualities. Although this is a possible limitation, it is also of interest to suggest the upward approach for future research in that by considering the achievement of this thesis, look into the idea as to how employees conceive the availability of advanced communication technologies in reducing complexities to develop knowledge creation.

Fifth, this study is unable to raise minor issues that could potentially take place in different geographical destinations where they can be considered within the case companies' supply networks and as a result of that measurement is partial in that sense. Thus, it is not possible to reflect the effects of those aspects on this thesis. Further revision to consider global production sub-contractors might be necessary.

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Appendices

Appendix 1

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www.kcl.ac.uk

Dear sir/madam;

My name is Farhad Hassani Mehraban, and I would be contacting you to request interviews with someone from department managers at ... including supply chain, procurement, sales, purchasing and IT for my PhD project.

This is a project looking at the way in which fashion companies are using their customers and suppliers and the way in which that is their ideas and interests transfer in supply chain. My main interest is in the effects that all of that is having on key players of fashion industry in UK. I am also looking at the effectiveness of knowledge management generally, and more specifically at its application for the fashion supply chains. I will be asking about the company's valuable relationships and networks, processes, structures and culture and skills and behaviours. I want to learn what effects — positive and negative — customers and suppliers have on the companies' business strategies. Each interview will probably last between one and one and half hour only.

I will be writing a report based on these interviews and all information I gather from these interviews will be presented in such a way that the respondents cannot be identified. This is a chance for you to give some candid and anonymous feedback if you are pleased.

Thank you for taking the time to consider this request and I look forward to hearing from you in the near future.

Farhad Hassani Mehraban
Second Year PhD Students Representative
Department of Management
School of Social Science and Public Policy
King's College London

Appendix 2

INFORMATION SHEET FOR PARTICIPANTS



REC Reference Number:

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Supply Chain Knowledge Creation

I would like to invite you to participate in a PhD research project. This is a project looking at the way in which fashion companies are communicating with their customers and their suppliers in order to make the most of their knowledge to manage supply chain accordingly. I will be asking about the company's valuable relationships with their suppliers and customers. Therefore, the most attention will be paid to the important activities in the supply chain that are dependent on customers' and suppliers' ideas including processes, technologies and capabilities to coordinate the supply chain members, i.e., manufacturing, logistics, materials, distribution and transportation. Questions will focus on the interactions that the company has whether in a physical space such as an office or a virtual space such as the Internet.

My goal is to interview participants from different managerial positions, mainly directors or managers of the company who are in charge of different departments. The interview will take approximately 60-90 minutes. Every company that will take part in the research process will be given the opportunity to receive any research reports including my PhD dissertation. Please note the following:

- If you do decide to take part you will be given this information sheet to keep.
- You will be asked to sign a consent form documenting that you agreed to participate in interview.
- With your additional consent, the interview will be recorded.

- It is up to you to decide whether to take part or not. If you decide to take part you are still free to withdraw at any time and without giving a reason before end of September 2011.

If you have any further questions or concerns please contact my PhD advisor at:

Dr. Matt Vidal

Email: matt.vidal@kcl.ac.uk

Tel: + 44 (0)20 7848 3884

Thank you for taking the time to consider this request and I look forward to hearing from you in the near future.

Farhad Hassani Mehraban

Email: farhad.hassani_mehraban@kcl.ac.uk



CONSENT FORM FOR PARTICIPANTS IN RESEARCH STUDIES

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: _____

King's College Research Ethics Committee Ref: _____

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

**Please tick
or initial**

- I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and withdraw from it immediately without giving any reason. Furthermore, I understand that I will be able to withdraw my data up to the point of publication *[OR insert date if stated on Information Sheet]*. ☐
- I consent to the processing of my personal information for the purposes explained to me. I understand that such information will be handled in accordance with the terms of the Data Protection Act 1998. ☐
- I consent to my interview being recorded. ☐

- This interview may be conducted at various levels of confidentiality. Please choose the level with which you feel comfortable.

☐

1. ____ **On the record:** Anything I say in this interview may be quoted in any venue, with attribution.
2. ____ **On background:** Information and quotations from this interview may be released, but without direct attribution. That is, information released will be (approximately) of the form “A supplier interviewed said...” without naming the supplier.

Participant’s Statement:

I _____ -

agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the notes written above and the Information Sheet about the project, and understand what the research study involves.

Signed

Date

Investigator’s Statement:

I _____

Confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the participant.

Signed

Date

Appendix 3

The Interview Questions

General and Organizational Details

- **General**

1. Please give me your formal job title and describe the activities and areas you are responsible for in general and in daily routine.
2. Please describe the main strengths and the main weaknesses of your company.
3. Please describe the main factors you think are critical to the future success of your company.

- **Strategy**

4. Please describe a brief background of the company.
5. Please classify your company in the apparel classification.
6. Please describe the classification of your brands.
7. For your key or representative product please describe the key steps in producing it.
 - a) If you design your own, how did you come to have this capability?
8. What are your key performance criteria and how are they monitored?
9. Who and where are your key up/downstream supply chain companies (i.e. top two or three)?
 - a) Do you have some of them that you have long-term relationships with?
 - b) What is the selection of customers and suppliers be based on? Do you have some supplier relationships based only on price, and others based on criteria such as quality and flexibility? Or design capability?

Knowledge Creation

- **Intra-organizationally**

10. Please explain how important is your role in the company for producing fresh ideas.
11. Please describe how you understand the role of knowledge for your company.
 - a) If you have a formal process for knowledge management, how does it work? If not, who is mainly responsible for managing knowledge in your company?

12. Are there any knowledge gaps in the company?
 - a) If so, does management address these gaps?
13. Is your department allowed to work independently of other departments?
14. Does your company have employees with sufficient skills to come up with new ideas? If so, how are they managed to be useful for company's corporate knowledge process as well as employees' empowerment and job satisfaction?
15. Are there important routines or activities in the organization that are dependent on specific knowledge that only one or a few particular individuals have?
 - a) How would staff leaving the company at any point have no result in a loss of knowledge?
16. Has the 'how to' of your job been written down or formalized?
- **Inter-organizationally**
17. Is it essential for long-term supply chain success to link knowledge management practices between supply chain companies?
 - a) If so, how is this managed?
18. Do you think that you are a "strategic customer/supplier" to your up/downstream supply chain companies (i.e. do your key customers/suppliers have an alternative to your service)?
19. Is communication with supply chain companies vital?
 - a) Does your company do so to learn more?
20. How do you communicate with your key customers and suppliers in order to use their knowledge?
 - a) What are the best ways to approach to the customers and suppliers knowledge (i.e. sharing experiences by individual and face-to-face interaction or formal training, meeting, documentation, or computerized communication methods)?
 - b) How frequently does each method apply?
 - c) Are there sufficient methods in place to disseminate knowledge?
 - d) Is the knowledge that you have gained about the suppliers and customers sufficient for your company?
21. Are business strategies of your company developed in conjunction with your up/downstream customers? (i.e. do they respond to your request for

communication during the development of new product or service as you expect?)

- 22.** Do you share information freely within supply chain? (i.e. do you share confidential or proprietary information with any of them?)
- a) What types of knowledge does your company provide to your suppliers about the product/service to make them buy your products?
 - b) Do your customers know your business well?
 - c) Are there any problems with communication and knowledge sharing in the supply chain? (i.e. do you face with suppliers withholding information?)
- 23.** What type of knowledge do you need about/from your up/downstream companies to share with you in order to generate new ideas?
- 24.** How do you use up/downstream supply chain knowledge for success?
- a) Is your order placing developed based on the understanding of your up/downstream knowledge?
- 25.** Is the customer's customer/supplier's supplier knowledge also crucial to your business?
- 26.** How would you rate the level of trust between you and your up/downstream supply chain companies?
- a) How has it changed over time?